

UNITED STATES DEPARTMENT OF COMMERCE

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WEATHER BUREAU

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# MONTHLY WEATHER REVIEW

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#### CORRECTIONS

MONTHLY WEATHER REVIEW, May 1943, vol. 71: pages 72-73, crest stage at Booneville, Mo., "23.5, May 20, 1943," should be "23.4, May 21"; crest stage at Hermann, Mo., "30.9, May 22," 1943, should be "30.85, May 21."

June 1943: page 101, crest stage at Waverly, Mo., "24.4, June 19, 1943," should be "24.3, June 18"; crest stage at Booneville, Mo., "28.7," should be "28.8"; crest stage at Hermann, Mo., "28.0," should be "28.1".

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## PRELIMINARY REPORT ON TORNADOES IN THE UNITED STATES DURING 1943 AND TOTALS AND AVERAGES, 1916-42, BY STATES

By J. L. BALDWIN

[Weather Bureau, Washington, D. C.]

THE tabulations for 1943, as shown in table 1, are derived from data on "Severe Local Storms" appearing in the MONTHLY WEATHER REVIEW and in monthly Climatological Data of the various sections of the United States. They show the approximate monthly and annual number of tornadoes and the deaths, injuries, and property damage caused by them in the several States and the country as a whole. A final and more complete report will appear in the United States Meteorological Yearbook, 1943.

Table 2 is a rather complete tabulation of the total and average yearly number of tornadoes and deaths and damage caused by them in each State or section for the period 1916-42. It is given for comparative purposes.

The total number of tornadoes reported during 1943 was 171, or 26 more than the normal. Of these, 61 occurred in May. The greatest monthly number generally occurs during this month, but this is approximately twice the usual number. It is probably due to several families or groups of tornadoes occurring in Kansas and Iowa. During the 3 months from April to June, 110, or nearly two-thirds of the tornadoes, were reported against only 3 relatively mild ones in the winter. Tornadoes were reported from 25 States. These were all east of the Rocky Mountains. They were the most widespread in May when reported from 15 States extending from Colorado and Texas to North Carolina and New York.

There were 50 deaths or only approximately one-fifth the average toll of these twisters; about 840 people were injured. Most of the deaths and injuries occurred during April and May. Those that traveled through thickly settled areas caused a surprisingly low loss of life, as in the cases at Akron and Cleveland, Ohio. The most deaths from a single tornado were 6 at Roxobel, Bertie County, N. C., on April 19. No loss of life was attributed to approximately 40 tornadoes in Iowa and only 1 to about 25 in Kansas.

Property damage for the year was approximately \$12,161,800, which is about \$1,000,000 more than the usual destruction. More than half of this occurred during April and May, and practically none in January, February, and December. Ohio led with losses of \$4,600,000, followed by Texas with \$2,138,000, while Iowa and Kansas had somewhat less than \$1,000,000 damage each. In the area occupied by the 10 States—Oklahoma, Arkansas (none), Nebraska, Missouri, Illinois, Kentucky (none), Tennessee, Mississippi, Georgia, and South Carolina (none)—where normally 52 tornadoes kill about 155 people and destroy almost \$6,000,000 worth of property annually, there were only 28 tornadoes in 1943 which killed 14 people and destroyed property valued at less than \$160,000.

Probably the most severe tornado during 1943 occurred at Akron, Ohio, on the evening of April 27. This was the

most destructive single tornado in Ohio, since the great Lorain storm of June 28, 1924, in which 73 lives and \$11,000,000 worth of property were lost. The tornado began about 8 p. m. at Wadsworth about 14 miles west-southwest of the center of Akron and moved eastward across the city of Akron to Mogadore, traveling a course of over 20 miles in about 50 minutes. The intensity of its destruction varied considerably. There was surprisingly no loss of life, although it traveled through thickly populated areas. Over 100 persons were injured and property damage exceeded \$2,000,000. The Akron Chamber of Commerce reported that 955 buildings of all types were damaged or destroyed, including factories, houses, and smaller structures. Extensive damage was done to several war plants, necessitating some shutdowns for repairs. Between 8:25 and 8:40 p. m. of the same evening tornadoes moved east-southeastward across Cleveland, passing only about 2 miles south of the Public Square. In spite of the fact that the path of destruction was about 300 feet wide and extended 14 miles through thickly settled areas, there were no direct loss of life and only about 100 were injured. These tornadoes (probably 3) seemed to bound along, leaving destruction estimated at near \$1,000,000 in their paths. There were a number of additional tornadoes during the same evening in other areas of northern Ohio, which killed 3 people, injured 12, and destroyed about \$400,000 worth of property. These storms occurred in connection with a prefrontal squall line in a narrow warm sector associated with a low-pressure system that was passing eastward across the lower Lakes. Northern Ohio was again visited by another series of tornadoes on the evenings of August 12 and 13. These killed 3 people, injured 64, and did \$1,180,000 damage.

One of the most destructive tornadoes in Michigan's history passed 6 miles north of the Weather Bureau Office at East Lansing about 8:50 p. m., E. S. T., on June 1. In a 25-mile path it destroyed practically every building on higher ground and passed over many in the valleys. The remarkable feature of this storm was that it destroyed \$600,000 worth of property, including 265 farm buildings, without killing a person and only slightly injuring 12.

On the afternoon and evening of May 15, a series of tornadoes, possibly as many as 17, occurred in Kansas, causing the death of 1 person, injuring over 200, and damaging property valued at approximately \$632,500. The death and most of the injuries occurred at the Cavalry Replacement Center at Fort Riley, with \$178,000 property loss. Three miles south of Wamego 6 funnel clouds were observed passing by within half an hour, and at Maple Hill 5 distinct vortex clouds were seen. Near Peterton, it was reported that a Shetland pony was blown 1 mile and let down without injury in another pasture. At almost exactly 1 month later, another series of tornadoes,

probably 76, did about \$331,700 worth of damage without the loss of a human life in this State.

About 17 tornadoes were reported from Texas, with the loss of 9 lives, injury of 108 persons, and property damage of \$2,138,000. One of these occurred at San Augustine about 4:45 p. m., March 5 and killed 1 person, injured 8, and did about \$500,000 damage to buildings. One of the most serious tornadoes, moving northeastward over a narrow path 15 miles long, struck Laid Hill about 12:50 p. m. and Kilgore about 1:05 p. m. on May 10. Damage to buildings was estimated at \$1,000,000, 4 persons were killed, and 25 injured. On November 6 a tornado moving north-northeastward struck Freeport about 5:50 p. m., where it killed 2 persons, injured 36, and destroyed 250 houses and business buildings estimated at \$450,000. At

about 8 p. m. on the same day a tornado, thought to be the same one that struck Freeport earlier in the evening, destroyed \$150,000 worth of property and injured 33 people seriously at Galveston.

Other tornadoes on the night of November 6 and early the 7th killed 5 persons, injured 15, and damaged property to the extent of \$210,000 in Louisiana. A very destructive tornadic storm occurred in Clark County, Ind., on July 29, with estimated property damage of \$800,000 and injury of 7 persons.

At Petoskey, Mich. on September 10, three waterspouts were observed moving eastward across Little Traverse Bay. They ranged in height from 100 to 200 feet and the largest was visible for 15 minutes. On the same date two or three were also reported as being over Saginaw Bay.

TABLE 1.—Tornadoes and probable tornadoes

| State*              | January | February | March | April | May      | June    | July     | August | September | October | November | December | Annual   |
|---------------------|---------|----------|-------|-------|----------|---------|----------|--------|-----------|---------|----------|----------|----------|
| Alabama:            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          |       | 2     | 1        |         |          |        |           |         |          |          | 3        |
| Deaths              |         |          |       | 6     |          |         |          |        |           |         |          |          | 6        |
| Injuries            |         |          |       | 74    |          |         |          |        |           |         |          |          | 74       |
| Damage (\$ × 1,000) |         |          |       | 600.0 | 102.5    |         |          |        |           |         |          |          | 702.5    |
| Colorado:           |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          |       | 1     | 1        |         |          |        |           |         |          |          | 2        |
| Deaths              |         |          |       |       | 1        |         |          |        |           |         |          |          | 1        |
| Injuries            |         |          |       | (?)   | (?)      |         |          |        |           |         |          |          | (?)      |
| Damage (\$ × 1,000) |         |          |       | (?)   | (?)      |         |          |        |           |         |          |          | (?)      |
| Florida:            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         | 1        | 1     | 2     |          |         |          |        |           |         |          |          | 4        |
| Deaths              |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Injuries            |         |          | 30    | 10    |          |         |          |        |           |         |          |          | 40       |
| Damage (\$ × 1,000) |         | 0.3      | 500.0 | (?)   |          |         |          |        |           |         |          |          | 500.3    |
| Georgia:            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              | 2       |          |       |       | 1        |         |          |        |           |         |          |          | 3        |
| Deaths              |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Injuries            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Damage (\$ × 1,000) | (?)     |          |       |       | (?)      |         |          |        |           |         |          |          | (?)      |
| Illinois:           |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          |       |       | 2        |         |          |        |           |         |          |          | 2        |
| Deaths              |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Injuries            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Damage (\$ × 1,000) |         |          |       |       | 11.0     |         |          |        |           |         |          |          | 11.0     |
| Indiana:            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          | 1     |       | 1        |         | 2        |        |           |         |          |          | 4        |
| Deaths              |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Injuries            |         |          | 2     |       |          |         | 7        |        |           |         |          |          | 9        |
| Damage (\$ × 1,000) |         |          | 10.0  |       | 1.0      |         | 800.6    |        |           |         |          |          | 811.6    |
| Iowa:               |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          | 6     |       | 22       | 7       | 3        | 2      |           |         |          |          | 40       |
| Deaths              |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Injuries            |         |          | 7     |       | 11       |         |          |        |           |         |          |          | 18       |
| Damage (\$ × 1,000) |         |          | 280.0 |       | \$ 474.5 | \$ 77.0 | \$ 110.0 | (?)    |           |         |          |          | \$ 941.5 |
| Kansas:             |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          |       | 2     | 17       | 6       |          |        |           |         |          |          | 25       |
| Deaths              |         |          |       |       | 1        |         |          |        |           |         |          |          | 1        |
| Injuries            |         |          |       |       | 200      | 1       |          |        |           |         |          |          | 201      |
| Damage (\$ × 1,000) |         |          |       | 6.0   | 632.5    | 331.7   |          |        |           |         |          |          | 970.2    |
| Louisiana:          |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          |       |       | 1        |         |          |        |           |         | 5        |          | 6        |
| Deaths              |         |          |       |       |          |         |          |        |           |         | 5        |          | 5        |
| Injuries            |         |          |       |       |          |         |          |        |           |         | 15       |          | 15       |
| Damage (\$ × 1,000) |         |          |       |       | 25.0     |         |          |        |           |         | 210.0    |          | 235.0    |
| Maryland:           |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          |       | 1     |          |         |          |        |           |         | 2        |          | 3        |
| Deaths              |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Injuries            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Damage (\$ × 1,000) |         |          |       | (?)   |          |         |          |        |           |         | 20.0     |          | 20.0     |
| Michigan:           |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          |       |       | 2        | 2       |          |        |           |         |          |          | 4        |
| Deaths              |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Injuries            |         |          |       |       | 2        | 14      |          |        |           |         |          |          | 16       |
| Damage (\$ × 1,000) |         |          |       |       | (?)      | 650.0   |          |        |           |         |          |          | 650.0    |
| Minnesota:          |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          |       |       |          |         | 3        | 2      | 2         |         |          |          | 7        |
| Deaths              |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Injuries            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Damage (\$ × 1,000) |         |          |       |       |          |         | (?)      | 45.0   | \$ 100.0  |         |          |          | \$ 145.0 |
| Mississippi:        |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          | 1     |       |          |         |          |        |           |         | 4        |          | 5        |
| Deaths              |         |          |       |       |          |         |          |        |           |         | 2        |          | 2        |
| Injuries            |         |          |       |       |          |         |          |        |           |         | 8        |          | 8        |
| Damage (\$ × 1,000) |         |          | 2.0   |       |          |         |          |        |           |         | \$ 10.0  |          | \$ 12.0  |
| Missouri:           |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          | 2     | 1     | 1        |         |          |        |           | 1       | 1        |          | 6        |
| Deaths              |         |          |       | 1     | 4        |         |          |        |           |         |          |          | 5        |
| Injuries            |         |          |       | 4     | 5        |         |          |        |           | 5       | 3        |          | 17       |
| Damage (\$ × 1,000) |         |          | 18.0  | (?)   | 7.5      |         |          |        |           | 55.0    | 5.0      |          | 85.5     |
| Montana:            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Number              |         |          |       |       |          | 1       |          |        |           |         |          |          | 1        |
| Deaths              |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Injuries            |         |          |       |       |          |         |          |        |           |         |          |          |          |
| Damage (\$ × 1,000) |         |          |       |       |          | (?)     |          |        |           |         |          |          | (?)      |

See footnotes at end of table.

TABLE 1.—Tornadoes and probable tornadoes—Continued

| State*              | January          | February | March   | April                 | May              | June    | July             | August           | September        | October          | November | December | Annual           |
|---------------------|------------------|----------|---------|-----------------------|------------------|---------|------------------|------------------|------------------|------------------|----------|----------|------------------|
| Nebraska:           |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          |         |                       |                  | 1       |                  |                  |                  | 1                |          |          | 2                |
| Deaths              |                  |          |         |                       |                  | 2       |                  |                  |                  |                  |          |          | 2                |
| Injuries            |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Damage (\$ × 1,000) |                  |          |         |                       |                  | 30.0    |                  |                  |                  | 4.0              |          |          | 34.0             |
| New York:           |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          |         |                       | 1                |         |                  |                  |                  |                  |          |          | 1                |
| Deaths              |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Injuries            |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Damage (\$ × 1,000) |                  |          |         |                       | ( <sup>1</sup> ) |         |                  |                  |                  |                  |          |          | ( <sup>1</sup> ) |
| North Carolina:     |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          |         | 1                     | 1                |         |                  |                  |                  |                  |          |          | 2                |
| Deaths              |                  |          |         | 6                     | 1                |         |                  |                  |                  |                  |          |          | 7                |
| Injuries            |                  |          |         | 23                    | 4                |         |                  |                  |                  |                  |          |          | 27               |
| Damage (\$ × 1,000) |                  |          |         | 129.0                 | 3.0              |         |                  |                  |                  |                  |          |          | 131.0            |
| Ohio:               |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          |         | 5                     | 2                |         | 2                | 5                |                  |                  |          |          | 14               |
| Deaths              |                  |          |         | 3                     |                  |         |                  | 3                |                  |                  |          |          | 6                |
| Injuries            |                  |          |         | 212                   |                  |         |                  | 64               |                  |                  |          |          | 276              |
| Damage (\$ × 1,000) |                  |          |         | 3,400.0               | 20.0             |         | ( <sup>1</sup> ) | 1,180.0          |                  |                  |          |          | 4,600.0          |
| Oklahoma:           |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          |         | 2                     | 3                | 3       | 1                |                  |                  |                  |          |          | 9                |
| Deaths              |                  |          |         | 2                     | 1                | 2       |                  |                  |                  |                  |          |          | 5                |
| Injuries            |                  |          |         | 12                    | 8                | 5       |                  |                  |                  |                  |          |          | 25               |
| Damage (\$ × 1,000) |                  |          |         | 40.0                  | 1.6              | 64.6    |                  |                  |                  |                  |          |          | 106.2            |
| Pennsylvania:       |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          |         |                       |                  |         | 2                |                  |                  | 1                |          |          | 3                |
| Deaths              |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Injuries            |                  |          |         |                       |                  |         | 2                |                  |                  | ( <sup>1</sup> ) |          |          | 2                |
| Damage (\$ × 1,000) |                  |          |         |                       |                  |         | 45.0             |                  |                  |                  |          |          | 45.0             |
| South Dakota:       |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          |         |                       |                  | 3       |                  |                  | 1                |                  |          |          | 4                |
| Deaths              |                  |          |         |                       |                  | 1       |                  |                  |                  |                  |          |          | 1                |
| Injuries            |                  |          |         |                       |                  | 4       |                  |                  |                  |                  |          |          | 4                |
| Damage (\$ × 1,000) |                  |          |         |                       |                  | 21.0    |                  |                  | ( <sup>1</sup> ) |                  |          |          | 21.0             |
| Tennessee:          |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          |         |                       |                  |         |                  | 1                |                  |                  |          |          | 1                |
| Deaths              |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Injuries            |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Damage (\$ × 1,000) |                  |          |         |                       |                  |         |                  | ( <sup>1</sup> ) |                  |                  |          |          | ( <sup>1</sup> ) |
| Texas:              |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          | 1       | 6                     | 5                |         | 1                | 2                |                  |                  | 2        |          | 17               |
| Deaths              |                  |          | 1       | 1                     | 4                |         | 1                |                  |                  |                  | 2        |          | 9                |
| Injuries            |                  |          | 8       | 4                     | 27               |         |                  |                  |                  |                  | 69       |          | 108              |
| Damage (\$ × 1,000) |                  |          | 500.0   | ( <sup>1</sup> ) 13.0 | 1,024.0          |         | ( <sup>1</sup> ) | 1.0              |                  |                  | 600.0    |          | 2,138.0          |
| Wyoming:            |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              |                  |          |         |                       |                  | 3       |                  |                  |                  |                  |          |          | 3                |
| Deaths              |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Injuries            |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Damage (\$ × 1,000) |                  |          |         |                       |                  | 2.0     |                  |                  |                  |                  |          |          | 2.0              |
| United States:      |                  |          |         |                       |                  |         |                  |                  |                  |                  |          |          |                  |
| Number              | 2                | 1        | 12      | 23                    | 61               | 26      | 14               | 12               | 3                | 3                | 14       |          | 171              |
| Deaths              |                  |          | 1       | 19                    | 12               | 5       | 1                | 3                |                  |                  | 9        |          | 50               |
| Injuries            |                  |          | 47      | 339                   | 257              | 24      | 9                | 64               |                  | 5                | 95       |          | 840              |
| Damage (\$ × 1,000) | ( <sup>1</sup> ) | 0.3      | 1,310.0 | 4,187.0               | 2,302.6          | 1,176.3 | 955.6            | 1,226.0          | 100.0            | 59.0             | 845.0    |          | 12,161.8         |

\*None reported from States not listed.

<sup>1</sup> Press report.<sup>2</sup> Several hundred (slight).<sup>3</sup> Several thousand.

\* Considerable damage.

\* Considerably more.

\* Includes some hail, rain, and straight-line wind damage.

\* Part of a general storm.

TABLE 2.—Tornadoes

[Number, deaths, and damage by States]

| State or section      | Totals 1916-42 |        |              | Average yearly |        |           | State or section | Totals 1916-42 |        |             | Average yearly |        |            |
|-----------------------|----------------|--------|--------------|----------------|--------|-----------|------------------|----------------|--------|-------------|----------------|--------|------------|
|                       | Number         | Deaths | Damage       | Number         | Deaths | Damage    |                  | Number         | Deaths | Damage      | Number         | Deaths | Damage     |
| Alabama               | 157            | 640    | \$11,434,200 | 5.8            | 23.7   | \$423,489 | New England      | 32             | 4      | \$1,890,700 | 1.2            | 0.2    | \$68,915   |
| Arizona               | 2              | 0      | 2,500        | 0.1            | 0      | 93        | New Jersey       | 11             | 2      | 1,560,500   | 0.4            | 0.1    | 57,796     |
| Arkansas              | 272            | 606    | 12,312,400   | 10.1           | 24.7   | 456,015   | New Mexico       | 31             | 5      | 306,400     | 1.1            | 0.2    | 11,345     |
| California            | 14             | 2      | 285,600      | 0.5            | 0.1    | 10,574    | New York         | 30             | 5      | 1,237,700   | 0.7            | 0.2    | 45,841     |
| Colorado              | 37             | 27     | 753,400      | 1.4            | 1.0    | 27,904    | North Carolina   | 48             | 30     | 3,339,300   | 1.6            | 1.4    | 123,678    |
| Florida               | 79             | 23     | 827,670      | 2.9            | 0.9    | 30,654    | North Dakota     | 46             | 30     | 1,393,000   | 1.7            | 1.1    | 61,593     |
| Georgia               | 99             | 468    | 24,273,830   | 3.7            | 17.3   | 899,031   | Ohio             | 76             | 142    | 18,922,150  | 2.8            | 8.3    | 700,820    |
| Idaho                 | 5              | 2      | 29,500       | 0.2            | 0.1    | 1,093     | Oklahoma         | 222            | 404    | 12,880,567  | 8.2            | 15.0   | 477,058    |
| Illinois              | 124            | 862    | 34,467,550   | 4.6            | 21.9   | 1,276,576 | Oregon           | 3              | 0      | 10,000      | 0.1            | 0      | 393        |
| Indiana               | 86             | 215    | 14,005,830   | 3.2            | 8.0    | 518,735   | Pennsylvania     | 43             | 10     | 3,046,500   | 1.0            | 0.4    | 112,833    |
| Iowa                  | 401            | 74     | 13,808,205   | 14.9           | 2.7    | 511,415   | South Carolina   | 92             | 164    | 7,078,300   | 3.4            | 0.1    | 262,159    |
| Kansas                | 425            | 149    | 14,551,815   | 15.7           | 3.5    | 538,956   | South Dakota     | 101            | 18     | 2,241,200   | 3.7            | 0.7    | 83,007     |
| Kentucky              | 28             | 168    | 5,202,600    | 1.0            | 6.2    | 192,089   | Tennessee        | 95             | 264    | 6,923,800   | 3.5            | 9.8    | 256,437    |
| Louisiana             | 116            | 230    | 5,536,220    | 4.3            | 8.5    | 205,045   | Texas            | 359            | 494    | 17,562,600  | 13.3           | 18.3   | 650,467    |
| Maryland and Delaware | 40             | 25     | 1,670,725    | 1.5            | 0.9    | 61,879    | Utah             | 2              | 0      | 4,000       | 0.1            | 0      | 148        |
| Michigan              | 72             | 21     | 8,813,450    | 2.7            | 0.8    | 326,424   | Virginia         | 26             | 32     | 1,247,000   | 1.0            | 1.2    | 46,185     |
| Minnesota             | 96             | 146    | 14,766,300   | 3.6            | 5.4    | 546,900   | Washington       | 3              | 0      | 250         | 0.1            | 0      | 9          |
| Mississippi           | 155            | 742    | 11,912,050   | 5.7            | 27.5   | 441,187   | West Virginia    | 2              | 3      | 30,000      | 0.1            | 0.1    | 1,111      |
| Missouri              | 178            | 387    | 34,224,950   | 6.6            | 14.3   | 1,267,961 | Wisconsin        | 109            | 92     | 8,076,000   | 4.0            | 3.4    | 299,111    |
| Montana               | 45             | 2      | 188,525      | 1.7            | 0.1    | 6,982     | Wyoming          | 20             | 3      | 414,073     | 1.1            | 0.1    | 15,336     |
| Nebraska              | 152            | 48     | 5,156,300    | 5.6            | 1.8    | 190,974   | United States    | 3,933          | 6,608  | 302,368,202 | 145.0          | 245.0  | 11,198,821 |
| Nevada                | 0              | 0      | 0            | 0              | 0      | 0         |                  |                |        |             |                |        |            |

## THE WEATHER OF 1943 IN THE UNITED STATES

By J. L. BALDWIN

[Weather Bureau, Washington, D. C.]

AMONG the outstanding features of 1943 was the persistent hot, dry weather in the southern part of the Western Plains and in the East Central States in summer. Crops, gardens, and livestock suffered severely in these areas, notably in Arkansas, Oklahoma, northwestern Texas, Kansas, and north-central Virginia. More than half of the days in July and August had 100° temperatures, or over at many stations in Arkansas, Oklahoma, and northern Texas, with the record July maximum of 120° equaled in Oklahoma.

Warm weather the last part of March and in April rapidly melted a deep snow cover on the frozen ground of the Northern Plains resulting in destructive floods in the Missouri Valley. Heavy rains in May resulted in floods affecting 7 States from Oklahoma to Michigan that caused extensive damage to agricultural and industrial areas. In parts of the Arkansas and Osage Rivers the floods were the greatest in 100 years, with near-record stages reached in the middle Mississippi, Illinois, Wabash, and Maumee Rivers.

An outstanding storm of the year was a tropical hurricane in southeastern Texas on July 27 which killed 18 persons and destroyed property valued at \$15,000,000. Millions of dollars damage was produced by winds on the Pacific Coast, mostly in California, on December 8-10.

Tornadoes killed 50 people and did approximately \$12,000,000 damage (see article in this REVIEW). Hail caused about \$4,575,000 damage in Illinois on July 28 at Peoria and vicinity and in Warren County, while losses exceeded in the same month \$2,000,000 in Iowa, and at least \$2,595,000 in Minnesota. Complete hail damage reports will appear in the United States Meteorological Yearbook for 1943.

Glaze and sleet on January 27-29 caused over \$1,000,000 damage in Virginia and the District of Columbia area. Another extensive glaze storm occurred in a south-central belt extending from Oklahoma to the middle Atlantic States on December 24-26.

An interesting example of temperature inversion occurred over the western portion of Wyoming on December 29 during the presence of a large stationary high-pressure area, when Lander had a temperature of 1° (its lowest for the month), while on the same date Dubois, 80 miles to the northwest and 1,600 feet higher, had 60° (its highest for the month). A much more phenomenal temperature contrast condition occurred in the Black Hills of South Dakota on January 20-23. This was described in an article by R. R. Hamann, of Rapid City, S. Dak., in the MONTHLY WEATHER REVIEW of March 1943.

## EFFECT ON CROPS

In general, the weather for the year 1943 was somewhat less favorable for agriculture than in 1942, principally because of untimely spring frosts, unfavorable wetness during the spring planting season and, later, harmful dryness in certain areas. Dry weather curtailed crop production in some sections, but in most of the principal agricultural States favorable conditions prevailed and the general farm output, while considerably less than for the preceding year, was larger than normal.

There were also several periods of unfavorably cold weather in the spring which heavily damaged fruit and

early vegetables over a wide south-central and southern belt, extending from the Atlantic Coast to the Great Plains, and unusually small crops of apples, peaches, cherries, apricots, and strawberries survived for harvest.

East of the Mississippi River, in addition to the untimely frost, the spring months brought frequent heavy rains to many sections which saturated and flooded lowlands and seriously hampered farmers in planting corn, haying, and other seasonal work. The corn crop got off to a late start, but with the advent of summer, favorable temperatures and much sunshine hastened development and relieved the apprehension of probable failure to mature before the fall frosts. Summer warmth hastened maturity and there was no material frost damage, while the fall season was unusually favorable for harvest; production for the country as a whole was the second largest of record.

The summer was warmer than normal in nearly all sections of the country and most of the principal agricultural States had sufficient moisture to produce good crops, but unfavorable dryness developed in central-eastern sections and much of the South.

The outstanding feature of the fall months was widespread dryness, in marked contrast to the two preceding falls. It was one of the driest falls of record over large areas. While this facilitated the harvesting of crops, the dryness was unfavorable for the seeding and germination of winter grains, especially in the western Winter Wheat Belt and the South.

About the middle of December a severe freeze overspread the South, resulting in more or less damage, heavy in localities, from Texas eastward to Florida and the Carolinas. Florida suffered most with a loss of truck crops, many ready for market, valued at more than 4 million dollars.

## TEMPERATURE

The mean temperature for the year 1943, derived by weighting the averages for the varying areas of the several States, was 53.4°, or only 0.2° above the average for the 1886 to 1943 period, during which time the highest mean annual temperature was 55.6° in 1921 and the lowest 51.8° in 1917.

Monthly and annual State temperature departures are presented by table 1, supplemented by a chart showing the annual distribution areally.

Yearly temperatures averaged generally 1° to 3° below normal in the more northern Rocky Mountains, some upper Mississippi Valley areas, the lower Peninsula of Michigan, and from northern Pennsylvania to Maine, while they were generally from 1° to over 3° above the average from eastern Montana and southern South Dakota southwestward over an extensive southwestern area, including the Great Basin and far Southwest. The highest State yearly average was 70.6° for Florida and the lowest was 39.8° for North Dakota. The greatest monthly State average was 87.1° for Oklahoma during August and the lowest was the January average of -1.4° for North Dakota.

The highest temperature reported during the year was 124° in July at 2 stations in California. The lowest was -60° at Island Park Dam, Idaho, on January 18.

January temperatures averaged below normal in the

Annual Temperature Departures (°F.) in the United States, 1943.



Percentage of Normal Annual Precipitation (inches) in the United States, 1943, (Based on First-Order Stations)



northern third of the country, where deficiencies of 5° to 9° occurred in large northwestern areas, and above in the southern two-thirds. A severe cold wave overspread the northern interior between the 16th and 19th, breaking the lowest January temperature records at many stations in Wyoming and Kansas. Zero reading extended to the Ohio Valley.

Cold weather again spread southeastward over the country about the middle of February with readings of -25° to -35° or lower, in New England, New York, and the North Central States and 10° or more below freezing in northern Florida. However, practically all of the country, except Florida, showed averages above normal for that month, especially the northwestern Plains.

March also was characterized by pronounced short-period successions of unseasonably cold and abnormally warm weather. The most severe cold of the season prevailed over practically the entire region from the Rocky Mountains eastward from about the 1st to the 9th. It broke practically all of the lowest March temperature records in Georgia, and on the 3d equaled the lowest March reading of 9° in Mississippi. Subzero temperatures were recorded in Arkansas for the first time in March, while -22° in Missouri was 10° lower than any previous March reading on record, and -45° in Michigan set a new low for this month in that State.

Temperature averages for April were generally below normal east of the Mississippi River and above to the westward, with deficiencies of 7° centered in western New York, and excesses of 8° in middle Rocky Mountain areas. Freezing extended almost to the Gulf on the 14-16. It was the coldest April on record in New York. May was persistently cool in the Northwest and North Central States and seasonal to considerably above normal in the East and South.

June was decidedly warmer than normal in central and eastern portions and cooler than usual rather generally west of the Rocky Mountains. It was the warmest June of record in South Carolina, Virginia, West Virginia, New Jersey, Maryland, and Delaware.

Temperatures for July averaged normal to about 5° above for practically the entire country. They continued generally above normal through August, especially in the drought areas of Arkansas, Oklahoma, Texas, Kansas, Virginia, and adjoining sections.

September was cool east of the Rockies, with deficiencies of 4° to 6° in the middle Mississippi Valley, but warm weather continued in the far West, ranging up to over 8° above normal in Oregon.

In October warmer than usual weather prevailed from the Pacific coast to Lake Michigan, especially in North Dakota, while temperatures averaged generally below normal from Texas and the Gulf to eastern Canada, with the largest deficiencies, 4°, centered in Alabama. "Indian Summer" was reported from the Northwest. Near the middle of the month freezing extended nearly to the Gulf and some low temperature records for the month were broken in northern Florida.

November temperatures were somewhat above normal in the far West and slightly below between the Gulf and Great Lakes. December was warmer than usual from the Pacific to the western Lakes and colder than normal from New Mexico and Texas to New England. A cold wave spread southeastward at the middle of the month, bringing below-zero readings to the interior as far south as Tennessee on the 16-17 and severe freezes into Florida from the 16th to 19th.

## PRECIPITATION

The average annual precipitation for the country as a whole, based on weighted averages, was 26.27 inches, or 2.78 inches less than the average for the 1886 to 1943 period, during which time the wettest year was 32.74 inches in 1915 and the driest 24.65 inches in 1910.

Figure 1 gives the percentages of normal precipitation by States for 1943; figure 2, the percentages for the growing season; table 2, the percentages for the months and the year; and table 3, the monthly and annual amounts. The areal distribution of annual precipitation is shown in percentages by chart.

Precipitation for the year was much below normal in a large area extending southward from the southern New England coast to the Carolinas and southwestward to southwestern Texas and New Mexico, and in the region from South Dakota to Texas. More than the usual amount fell along the West Gulf coast, in the middle portion of the far West, in central and western Missouri, and at slightly more than half of the stations from eastern Montana to Maine. Arkansas, Mississippi, Nebraska, and Washington received approximately three-fourths of their normal amount, while 10 percent more than normal fell in the Great Basin.

On an annual basis, the wettest State was Louisiana with 51.73 inches. This was the only State to have an average total of 50 inches compared to 6 States in 1942. The driest State, as is usually the case, was Nevada with 9.69 inches. On a country-wide basis, the winter, including December of 1942, had 93 percent of normal precipitation; spring 108 percent; summer 94 percent, and fall

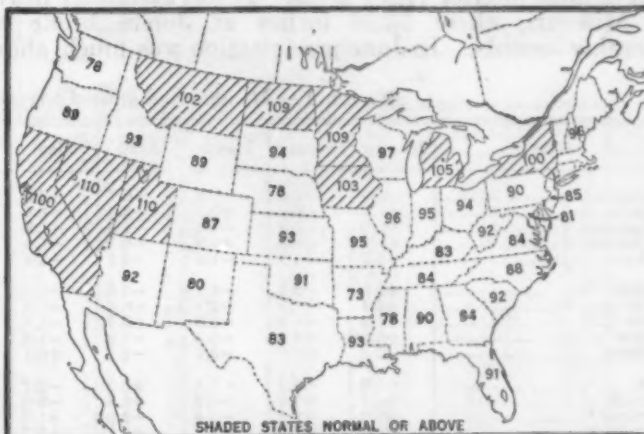


FIGURE 1.—Percentage of normal precipitation, 1943.

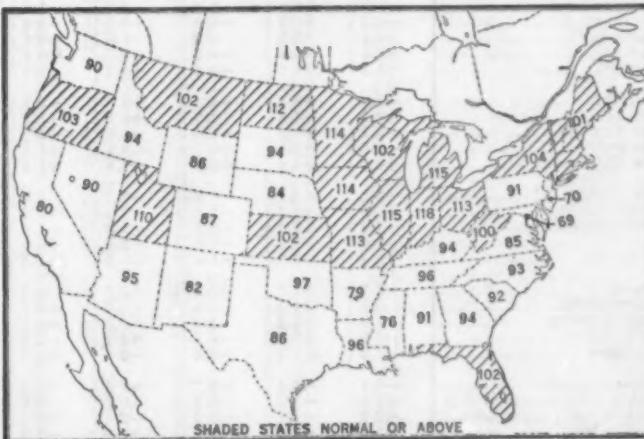


FIGURE 2.—Percentage of normal precipitation, April 1-September 30, 1943.

80 percent. May was the wettest month, averaging 3.46 inches, and February the driest, averaging 1.21 inches. This was the driest February of record for the United States.

During the April to September growing season, more than the usual amount of precipitation was received in Florida, Kansas, Utah, and Oregon, and in the area extending from Montana to Maine and thence southward to the Ohio Valley and Missouri; elsewhere, amounts were generally below normal, with only 69 percent of normal in Maryland and Delaware, 70 percent in New Jersey, 76 percent in Mississippi, and 79 percent in Arkansas.

The outstanding features of January's precipitation were extremely heavy amounts in most sections west of the Rockies, and extreme dryness in central interior portions of the country. It was the driest January of record in Missouri, Arkansas, and Oklahoma, with a State average of only 0.08 inch in Oklahoma, and the wettest since 1916 in Nevada and California.

February was outstanding for widespread deficiencies in precipitation, except in the Pacific States. The relatively driest States were Florida and New Mexico with 26 percent of normal, Texas 28 percent, and Arkansas 29 percent.

Most of the Plains States continued dry during March, with normal to above mostly elsewhere, especially in the Pacific States and from Ohio and Indiana southward. In April precipitation was generally subnormal in a large area from southern California and the Mexican border to South Dakota.

May was characterized by unprecedentedly heavy rainfall in most interior valley areas. It was extremely heavy in Missouri, where 25.54 inches at Joplin broke all monthly records. In June precipitation was much above

normal in a triangular area from Montana eastward to the upper Lakes and southward to Missouri.

Large excesses fell during July in most sections from Lake Erie southward over the South Atlantic and immediate middle Gulf States; however, large deficiencies developed in Arkansas and Oklahoma, with a dry area in the Central East centered in the lower Potomac Valley. Extreme dryness intensified during August in the middle Atlantic area and western Cotton Belt, with many stations reporting less than 25 percent of normal rainfall.

September precipitation was above normal from Tennessee and Alabama to southern Texas and in Florida, and generally deficient elsewhere, especially west of the Great Plains. Unusual contrasts prevailed in October, with large deficiencies mostly in the southern latitudes except southern Florida and Arkansas and large excesses in the Northeast and far Northwest.

Amounts were somewhat above normal during November from Minnesota to the north Atlantic Coast and in Alabama and Mississippi, and below elsewhere, decidedly so from Ohio, Kentucky, and Arkansas westward over practically the entire western part of the country. On November 6-8 the most severe snowstorm in Minnesota, for so early in the season, did \$1,100,000 damage, mostly by smothering 150,000 turkeys in that State. This snowstorm and blizzard blocked roads and suspended farm work from northeastern Nebraska to Wisconsin.

December precipitation was considerably above normal from southern California eastward over the southern Plains and Missouri, while it was much less than half the usual amounts in the northern half of the country, with only 9 percent of normal in Minnesota. It was the driest December for more than a century in the Minneapolis-St. Paul area and for over 54 years at Seattle.

TABLE 1.—Monthly and annual temperature departures from normal for the year 1943

| State                 | January | February | March | April | May  | June | July | August | September | October | November | December | Annual |
|-----------------------|---------|----------|-------|-------|------|------|------|--------|-----------|---------|----------|----------|--------|
| Alabama               | +2.9    | +2.0     | -1.4  | +0.7  | +2.9 | +3.5 | +1.6 | +2.4   | -3.0      | -2.9    | -2.0     | -0.4     | +0.5   |
| Arizona               | +1.7    | +3.0     | +1.5  | +3.3  | +1.4 | -1.3 | +0.2 | -0.6   | +1.1      | +0.2    | +0.4     | -0.2     | +0.9   |
| Arkansas              | +0.6    | +3.9     | -5.6  | +1.4  | +1.8 | +2.7 | +2.3 | +4.5   | -3.9      | -1.5    | -0.6     | -2.1     | +0.3   |
| California            | +1.1    | +1.5     | +0.9  | +0.9  | +1.4 | -3.8 | -0.8 | -1.7   | +3.7      | +0.2    | +1.2     | +0.9     | +0.5   |
| Colorado              | +2.2    | +4.8     | -1.8  | +0.1  | -1.4 | -0.6 | +1.5 | +2.3   | +0.3      | +0.5    | +0.8     | +0.9     | +1.3   |
| Florida               | +2.0    | -2.0     | -0.1  | -0.6  | +1.7 | +1.3 | +0.4 | +0.6   | -0.4      | -2.6    | -1.7     | -0.5     | -0.2   |
| Georgia               | +2.4    | +1.2     | -2.1  | -0.6  | +1.2 | +2.6 | +0.4 | +1.5   | -2.9      | -2.5    | -1.7     | -0.4     | -0.1   |
| Idaho                 | -1.2    | +1.3     | -3.8  | +3.7  | -2.8 | -3.8 | -0.6 | -1.0   | +3.4      | +1.8    | +1.1     | +1.3     | 0.0    |
| Illinois              | +0.6    | +4.1     | -3.8  | -1.0  | -1.2 | +2.9 | +1.0 | +2.4   | -4.2      | -0.7    | -3.0     | -1.8     | -0.4   |
| Indiana               | +0.6    | +3.1     | -3.0  | -2.2  | +0.1 | +4.0 | +0.6 | +1.8   | -4.0      | -0.8    | -2.6     | -2.3     | -0.4   |
| Iowa                  | -1.9    | +5.1     | -3.6  | +0.2  | -2.7 | +2.0 | +0.7 | +1.8   | -3.6      | -0.1    | -2.5     | +1.9     | -0.2   |
| Kansas                | +0.7    | +7.3     | -3.9  | +3.4  | -3.0 | +1.6 | +1.4 | +4.9   | -2.2      | -1.5    | -0.7     | -2.4     | +0.5   |
| Kentucky              | +2.2    | +3.1     | -3.6  | -2.0  | +1.9 | +3.6 | +0.7 | +2.2   | -4.0      | -1.7    | -1.9     | -2.6     | -0.2   |
| Louisiana             | +0.1    | +1.8     | -2.9  | +1.1  | +3.2 | +2.0 | +1.0 | +2.0   | -2.8      | -3.2    | -3.7     | -1.0     | -0.2   |
| Maryland and Delaware | +0.8    | +3.0     | +0.2  | -3.4  | +1.5 | +5.6 | +0.3 | +2.1   | -1.8      | -1.7    | -1.0     | -0.9     | +0.4   |
| Michigan              | -3.8    | +2.6     | -3.9  | -4.0  | -1.8 | +2.3 | +0.3 | +1.0   | -3.8      | -1.1    | -2.2     | -1.4     | -1.3   |
| Minnesota             | -6.3    | +2.1     | -0.6  | -0.2  | -2.6 | +0.8 | +1.9 | +0.9   | -3.7      | +1.1    | -2.0     | +4.0     | -0.9   |
| Mississippi           | +1.1    | +2.2     | -3.0  | +0.8  | +3.6 | +3.4 | +2.2 | -3.2   | -2.8      | -2.4    | -2.8     | -0.9     | +0.4   |
| Missouri              | +0.3    | +5.9     | -4.2  | +0.7  | -0.6 | +2.2 | +1.5 | +3.2   | -3.5      | -1.4    | -1.7     | -3.0     | 0.0    |
| Montana               | -8.3    | +4.0     | -7.2  | +4.4  | -3.3 | -3.9 | -0.5 | +0.3   | +1.3      | +3.0    | +2.3     | +2.4     | -0.5   |
| Nebraska              | -0.2    | +8.8     | -4.1  | +3.8  | -3.1 | -0.1 | +1.7 | +4.1   | -1.5      | +0.3    | +0.1     | +2.1     | +1.0   |
| Nevada                | +3.5    | +4.8     | +2.9  | +5.8  | +1.7 | -3.4 | +0.7 | -0.7   | +4.6      | +2.3    | +0.9     | +2.2     | +2.1   |
| New England           | -3.5    | +1.2     | -2.0  | -5.0  | -0.2 | +2.9 | +0.7 | -0.4   | -1.5      | +0.4    | -0.8     | -4.8     | -1.1   |
| New Jersey            | -0.6    | +2.3     | +0.3  | -4.1  | +1.3 | +5.2 | +0.4 | +1.2   | -0.8      | -1.1    | -1.3     | -2.7     | 0.0    |
| New Mexico            | +2.2    | +4.0     | +0.3  | +4.6  | +1.2 | +0.3 | +0.4 | +2.8   | +0.2      | -0.7    | -1.2     | -2.4     | +1.0   |
| New York              | -3.6    | +2.1     | -0.8  | -5.7  | 0.0  | +4.7 | +0.9 | +0.5   | -1.5      | -1.0    | -1.9     | -3.5     | -0.8   |
| North Carolina        | +1.6    | +1.5     | -1.7  | -1.3  | +2.2 | +4.2 | -0.4 | +1.4   | -3.1      | -1.6    | -1.3     | -0.8     | +0.1   |
| North Dakota          | -7.8    | +5.4     | -6.8  | +3.3  | -3.6 | -2.5 | +1.5 | +1.2   | -1.2      | +4.2    | +1.9     | +5.1     | +0.3   |
| Ohio                  | +1.0    | +2.7     | -1.5  | -3.9  | +0.6 | +5.0 | +0.5 | +0.7   | -3.1      | -1.4    | -2.1     | -2.3     | -0.3   |
| Oklahoma              | +0.4    | +5.9     | -5.0  | +3.9  | -1.5 | +2.3 | +2.2 | +5.5   | -1.2      | -1.8    | -0.4     | -3.8     | +0.5   |
| Oregon                | -2.7    | +1.8     | -0.9  | +2.3  | -2.5 | -3.7 | -1.2 | -2.5   | +4.5      | +0.1    | +0.5     | -0.1     | -0.4   |
| Pennsylvania          | 0.0     | +1.5     | -0.4  | -5.5  | +0.7 | +4.8 | +0.4 | +0.5   | -2.8      | -2.5    | -2.6     | -3.0     | -0.7   |
| South Carolina        | +1.8    | +1.4     | -2.2  | -1.1  | +1.1 | +3.6 | -0.4 | +1.3   | -3.3      | -1.9    | -1.9     | -0.8     | -0.2   |
| South Dakota          | -6.9    | +7.6     | -5.7  | +4.1  | -2.7 | -0.9 | +1.4 | +2.7   | -1.5      | +2.6    | +0.1     | +4.4     | +0.4   |
| Tennessee             | +1.8    | +2.1     | -3.6  | -0.9  | +2.7 | +4.2 | +1.8 | +3.1   | -3.6      | -2.5    | -1.8     | -1.8     | +0.1   |
| Texas                 | -0.7    | +3.5     | -3.7  | +3.2  | +0.7 | +0.7 | +0.5 | +3.0   | -1.9      | -2.2    | -2.2     | -2.4     | -0.1   |
| Utah                  | +3.3    | +2.2     | -0.1  | +6.0  | -0.7 | -2.8 | +1.0 | +1.0   | +3.2      | +2.5    | +0.7     | +2.5     | +1.6   |
| Virginia              | +2.2    | +2.3     | -1.1  | -2.4  | +2.4 | +4.9 | +0.2 | +1.7   | -2.7      | -1.4    | -0.6     | -1.0     | +0.4   |
| Washington            | -5.6    | +2.4     | -2.9  | +1.9  | -2.8 | -2.6 | -0.1 | -1.6   | +3.3      | +0.8    | +1.1     | -0.3     | -0.5   |
| West Virginia         | +3.0    | +1.3     | -2.3  | -3.9  | +1.7 | +5.2 | +0.2 | +0.5   | -3.8      | -2.3    | -2.1     | -2.6     | -0.4   |
| Wisconsin             | -3.1    | +1.6     | -5.8  | -2.0  | -1.2 | +2.6 | +1.7 | +1.8   | -4.4      | 0.0     | -3.3     | +2.0     | -0.8   |
| Wyoming               | +0.3    | +5.7     | -4.7  | +7.5  | -2.2 | -1.6 | +1.5 | +3.1   | +1.5      | +2.9    | +2.4     | +2.4     | +1.6   |

TABLE 2.—Percentage of normal precipitation, 1943

| State                 | January | February | March | April | May | June | July | August | September | October | November | December | Annual |
|-----------------------|---------|----------|-------|-------|-----|------|------|--------|-----------|---------|----------|----------|--------|
| Alabama               | 82      | 43       | 169   | 84    | 96  | 81   | 85   | 77     | 135       | 32      | 106      | 72       | 90     |
| Arizona               | 138     | 40       | 128   | 60    | 31  | 97   | 47   | 135    | 133       | 98      | 4        | 117      | 92     |
| Arkansas              | 23      | 29       | 121   | 66    | 163 | 70   | 30   | 29     | 96        | 116     | 28       | 83       | 73     |
| California            | 170     | 61       | 132   | 120   | 35  | 119  | 57   | 33     | 17        | 93      | 41       | 81       | 100    |
| Colorado              | 132     | 67       | 102   | 52    | 130 | 107  | 64   | 129    | 28        | 79      | 62       | 87       | 87     |
| Florida               | 64      | 26       | 136   | 76    | 124 | 94   | 110  | 102    | 96        | 61      | 83       | 50       | 91     |
| Georgia               | 132     | 37       | 161   | 106   | 122 | 97   | 90   | 76     | 87        | 24      | 82       | 92       | 94     |
| Idaho                 | 121     | 85       | 108   | 110   | 80  | 156  | 81   | 78     | 18        | 154     | 47       | 55       | 93     |
| Illinois              | 51      | 53       | 87    | 108   | 218 | 98   | 93   | 89     | 67        | 83      | 65       | 50       | 96     |
| Indiana               | 37      | 60       | 126   | 90    | 218 | 93   | 127  | 74     | 94        | 59      | 66       | 42       | 95     |
| Iowa                  | 73      | 72       | 88    | 93    | 109 | 143  | 130  | 142    | 58        | 76      | 62       | 46       | 103    |
| Kansas                | 28      | 59       | 89    | 77    | 121 | 141  | 91   | 72     | 87        | 89      | 17       | 179      | 93     |
| Kentucky              | 84      | 51       | 162   | 97    | 138 | 98   | 103  | 35     | 89        | 64      | 39       | 58       | 83     |
| Louisiana             | 63      | 57       | 166   | 54    | 80  | 82   | 78   | 56     | 266       | 46      | 98       | 100      | 93     |
| Maryland and Delaware | 87      | 63       | 96    | 88    | 125 | 72   | 55   | 30     | 55        | 172     | 112      | 45       | 81     |
| Michigan              | 96      | 100      | 137   | 97    | 153 | 155  | 104  | 100    | 72        | 73      | 115      | 40       | 105    |
| Minnesota             | 119     | 103      | 118   | 51    | 140 | 142  | 124  | 125    | 65        | 93      | 115      | 9        | 109    |
| Mississippi           | 41      | 51       | 151   | 64    | 85  | 61   | 55   | 46     | 183       | 36      | 108      | 74       | 78     |
| Missouri              | 16      | 45       | 82    | 75    | 211 | 138  | 70   | 65     | 88        | 115     | 35       | 98       | 95     |
| Montana               | 130     | 80       | 99    | 140   | 75  | 156  | 70   | 117    | 28        | 131     | 57       | 49       | 102    |
| Nebraska              | 42      | 52       | 70    | 90    | 64  | 124  | 102  | 61     | 43        | 85      | 38       | 25       | 78     |
| Nevada                | 188     | 79       | 129   | 143   | 37  | 196  | 79   | 32     | 51        | 155     | 78       | 87       | 110    |
| New England           | 70      | 59       | 84    | 99    | 152 | 101  | 115  | 95     | 49        | 151     | 147      | 29       | 96     |
| New Jersey            | 81      | 57       | 79    | 77    | 133 | 84   | 89   | 46     | 48        | 210     | 91       | 40       | 85     |
| New Mexico            | 69      | 26       | 72    | 27    | 85  | 146  | 80   | 88     | 57        | 42      | 70       | 203      | 80     |
| New York              | 72      | 81       | 95    | 123   | 161 | 100  | 102  | 101    | 41        | 163     | 110      | 28       | 100    |
| North Carolina        | 125     | 49       | 121   | 91    | 90  | 111  | 133  | 52     | 71        | 29      | 60       | 89       | 88     |
| North Dakota          | 149     | 102      | 164   | 104   | 100 | 147  | 109  | 133    | 35        | 74      | 76       | 24       | 109    |
| Ohio                  | 58      | 66       | 127   | 97    | 176 | 87   | 158  | 84     | 62        | 71      | 45       | 38       | 94     |
| Oklahoma              | 6       | 46       | 94    | 70    | 226 | 74   | 34   | 26     | 90        | 99      | 19       | 193      | 91     |
| Oregon                | 112     | 65       | 106   | 127   | 81  | 156  | 70   | 218    | 9         | 181     | 50       | 42       | 89     |
| Pennsylvania          | 83      | 58       | 78    | 115   | 158 | 81   | 104  | 65     | 21        | 177     | 99       | 36       | 90     |
| South Carolina        | 138     | 37       | 189   | 115   | 80  | 89   | 124  | 68     | 78        | 11      | 79       | 112      | 92     |
| South Dakota          | 118     | 81       | 68    | 45    | 84  | 160  | 82   | 99     | 46        | 154     | 89       | 20       | 94     |
| Tennessee             | 40      | 61       | 128   | 85    | 98  | 75   | 98   | 64     | 176       | 56      | 62       | 71       | 84     |
| Texas                 | 69      | 28       | 100   | 45    | 116 | 78   | 124  | 25     | 117       | 52      | 93       | 125      | 83     |
| Utah                  | 124     | 98       | 104   | 71    | 80  | 368  | 82   | 143    | 38        | 187     | 60       | 88       | 110    |
| Virginia              | 84      | 50       | 109   | 87    | 111 | 100  | 104  | 38     | 72        | 82      | 81       | 69       | 84     |
| Washington            | 57      | 85       | 117   | 120   | 92  | 102  | 71   | 130    | 24        | 137     | 37       | 57       | 78     |
| West Virginia         | 93      | 58       | 119   | 109   | 112 | 83   | 143  | 96     | 41        | 80      | 77       | 61       | 92     |
| Wisconsin             | 114     | 44       | 120   | 67    | 127 | 145  | 77   | 131    | 52        | 86      | 113      | 20       | 97     |
| Wyoming               | 135     | 69       | 103   | 88    | 104 | 124  | 53   | 82     | 38        | 110     | 68       | 71       | 89     |

TABLE 3.—Monthly and annual precipitation (inches), 1943

| State                 | January | February | March | April | May   | June | July | August | September | October | November | December | Annual |
|-----------------------|---------|----------|-------|-------|-------|------|------|--------|-----------|---------|----------|----------|--------|
| Alabama               | 4.07    | 2.30     | 9.87  | 3.72  | 3.74  | 3.50 | 4.72 | 3.64   | 4.40      | 0.86    | 3.44     | 3.50     | 47.76  |
| Arizona               | 1.73    | 0.54     | 1.32  | 0.34  | 0.10  | 0.32 | 0.98 | 3.08   | 3.22      | 1.70    | 0.04     | 1.80     | 12.45  |
| Arkansas              | 1.00    | 1.00     | 5.66  | 3.20  | 7.89  | 2.86 | 1.13 | 1.03   | 3.22      | 3.48    | 1.10     | 3.43     | 35.01  |
| California            | 8.24    | 2.66     | 4.82  | 2.04  | 0.35  | 0.37 | 0.04 | 0.03   | 0.08      | 1.13    | 0.95     | 3.30     | 24.01  |
| Colorado              | 1.04    | 0.65     | 1.31  | 0.92  | 2.40  | 1.49 | 1.41 | 2.51   | 0.39      | 0.89    | 0.48     | 0.77     | 14.26  |
| Florida               | 1.76    | 0.81     | 4.29  | 2.18  | 4.97  | 6.32 | 8.12 | 7.11   | 6.44      | 2.54    | 1.88     | 1.62     | 48.04  |
| Georgia               | 5.66    | 1.79     | 7.90  | 3.88  | 4.25  | 4.33 | 5.30 | 3.96   | 3.23      | 0.65    | 2.17     | 3.80     | 46.92  |
| Idaho                 | 2.68    | 1.48     | 1.94  | 1.58  | 1.43  | 2.09 | 0.52 | 0.47   | 0.18      | 2.24    | 0.92     | 1.15     | 16.68  |
| Illinois              | 1.21    | 1.04     | 2.75  | 3.70  | 8.79  | 3.84 | 3.00 | 2.97   | 2.41      | 2.08    | 1.74     | 1.27     | 34.80  |
| Indiana               | 1.17    | 1.47     | 4.67  | 3.20  | 8.71  | 3.58 | 4.22 | 2.51   | 3.13      | 1.60    | 2.02     | 1.16     | 37.44  |
| Iowa                  | 0.79    | 0.77     | 1.51  | 2.57  | 4.40  | 6.16 | 4.89 | 5.07   | 2.18      | 1.66    | 1.01     | 0.52     | 31.53  |
| Kansas                | 0.18    | 0.59     | 0.85  | 1.96  | 4.61  | 5.04 | 2.85 | 2.26   | 2.39      | 1.67    | 0.22     | 1.30     | 24.62  |
| Kentucky              | 1.54    | 1.81     | 7.62  | 3.91  | 5.43  | 4.54 | 4.21 | 1.32   | 2.58      | 1.67    | 1.33     | 2.20     | 37.66  |
| Louisiana             | 3.06    | 2.55     | 7.68  | 2.51  | 3.58  | 4.04 | 4.73 | 2.92   | 10.15     | 1.50    | 3.79     | 5.22     | 51.73  |
| Maryland and Delaware | 2.94    | 2.01     | 3.56  | 3.14  | 4.67  | 2.79 | 2.45 | 1.34   | 1.88      | 5.18    | 2.97     | 1.41     | 34.34  |
| Michigan              | 2.00    | 1.76     | 2.82  | 2.30  | 4.87  | 4.79 | 2.82 | 2.77   | 2.27      | 1.94    | 2.88     | 0.82     | 32.04  |
| Minnesota             | 0.95    | 0.78     | 1.37  | 1.10  | 4.42  | 5.67 | 4.07 | 3.99   | 1.80      | 1.70    | 1.31     | 0.07     | 27.23  |
| Mississippi           | 2.09    | 2.49     | 8.57  | 3.13  | 3.64  | 2.64 | 2.78 | 1.92   | 5.57      | 0.92    | 3.90     | 3.91     | 41.56  |
| Missouri              | 0.39    | 0.94     | 2.63  | 2.91  | 9.91  | 6.39 | 2.49 | 2.46   | 3.51      | 3.23    | 0.93     | 2.10     | 37.89  |
| Montana               | 1.57    | 0.57     | 0.93  | 1.60  | 1.56  | 4.00 | 0.99 | 1.24   | 0.37      | 1.34    | 0.52     | 0.42     | 15.11  |
| Nebraska              | 0.22    | 0.37     | 0.77  | 2.14  | 2.12  | 4.36 | 3.01 | 1.70   | 0.87      | 1.17    | 0.29     | 0.16     | 17.18  |
| Nevada                | 2.28    | 0.83     | 1.25  | 1.10  | 0.31  | 0.96 | 0.30 | 0.15   | 0.22      | 0.93    | 0.50     | 0.86     | 9.69   |
| New England           | 2.47    | 1.90     | 3.09  | 3.34  | 5.07  | 3.49 | 4.31 | 3.63   | 1.85      | 5.27    | 5.13     | 0.99     | 40.54  |
| New Jersey            | 2.97    | 2.01     | 3.01  | 2.82  | 4.92  | 3.24 | 4.21 | 2.16   | 1.85      | 7.55    | 2.89     | 1.41     | 39.04  |
| New Mexico            | 0.41    | 0.19     | 0.54  | 0.23  | 0.98  | 1.82 | 1.96 | 2.11   | 0.98      | 0.47    | 0.46     | 1.42     | 11.67  |
| New York              | 2.17    | 2.23     | 2.91  | 3.70  | 5.50  | 3.68 | 3.96 | 3.81   | 1.45      | 5.34    | 3.41     | 1.11     | 39.27  |
| North Carolina        | 4.72    | 1.97     | 5.05  | 3.27  | 3.67  | 5.24 | 7.89 | 2.94   | 2.79      | 0.94    | 1.61     | 3.36     | 43.45  |
| North Dakota          | 0.73    | 0.50     | 1.23  | 1.45  | 2.21  | 8.07 | 2.72 | 2.61   | 0.51      | 0.76    | 0.44     | 0.12     | 18.28  |
| Ohio                  | 1.80    | 1.68     | 4.44  | 3.12  | 6.39  | 3.37 | 6.01 | 2.88   | 1.83      | 1.76    | 1.23     | 1.03     | 35.54  |
| Oklahoma              | 0.08    | 0.63     | 1.99  | 2.33  | 10.28 | 2.76 | 0.96 | 0.77   | 2.75      | 2.82    | 0.39     | 3.10     | 28.86  |
| Oregon                | 4.55    | 2.05     | 3.03  | 2.58  | 1.40  | 2.00 | 0.30 | 0.87   | 0.11      | 3.60    | 1.80     | 1.68     | 23.97  |
| Pennsylvania          | 2.68    | 1.71     | 2.73  | 3.98  | 6.08  | 3.34 | 4.47 | 2.72   | 0.72      | 3.62    | 2.87     | 1.12     | 36.04  |
| South Carolina        | 4.94    | 1.58     | 6.09  | 3.70  | 2.88  | 4.27 | 7.22 | 3.90   | 3.14      | 0.33    | 1.84     | 3.94     | 43.83  |
| South Dakota          | 0.65    | 0.46     | 0.74  | 0.94  | 2.35  | 5.29 | 2.04 | 2.18   | 0.68      | 1.72    | 0.55     | 0.11     | 17.71  |
| Tennessee             | 1.95    | 2.65     | 6.94  | 3.77  | 4.09  | 3.15 | 4.37 | 2.59   | 5.31      | 1.56    | 2.22     | 3.21     | 41.81  |
| Texas                 | 1.31    | 0.51     | 2.04  | 1.32  | 4.25  | 2.37 | 3.23 | 0.61   | 3.48      | 1.33    | 2.11     | 2.83     | 25.39  |
| Utah                  | 1.50    | 1.24     | 1.44  | 0.82  | 0.91  | 2.10 | 0.71 | 1.40   | 0.38      | 2.00    | 0.54     | 0.98     | 14.02  |
| Virginia              | 2.76    | 1.85     | 4.03  | 2.95  | 4.34  | 4.20 | 4.85 | 1.73   | 2.32      | 2.50    | 2.04     | 2.17     | 35.74  |
| Washington            | 2.81    | 3.12     | 2.89  | 1.81  | 1.81  | 1.78 | 0.53 | 1.03   | 0.43      | 4.09    | 1.85     | 3.22     | 27.52  |
| West Virginia         | 3.43    | 1.89     | 4.59  | 3.84  | 4.59  | 3.64 | 6.36 | 3.95   | 1.25      | 2.26    | 2.12     | 1.96     | 40.06  |
| Wisconsin             | 1.62    | 0.57     | 2.17  | 1.67  | 4.80  | 5.75 | 2.63 | 4.31   | 1.86      | 2.10    | 2.06     | 0.27     | 29.51  |
| Wyoming               | 1.09    | 0.54     | 1.16  | 1.36  | 2.10  | 1.95 | 0.71 | 0.89   | 0.42      | 1.19    | 0.46     | 0.52     | 12.39  |

## METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR DECEMBER 1943

[Climate and Crop Weather Division, J. B. KINCEP, in charge]

## AEROLOGICAL OBSERVATIONS

NOTICE.—Effective with the December 1942 issue, the publication of table 1 (RAOB summaries) was discontinued indefinitely.—EDITOR.

TABLE 2.—Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during December, 1943. Directions given in degrees from North (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second

| Altitude<br>(meters)<br>m. s. l. | Abilene,<br>Tex.<br>(538 m.) |           |          | Albuquerque,<br>N. Mex.<br>(1,630 m.) |           |          | Atlanta,<br>Ga.<br>(299 m.) |           |          | Billings,<br>Mont.<br>(1,095 m.) |           |          | Bismarck,<br>N. Dak.<br>(512 m.) |           |          | Boise,<br>Idaho<br>(870 m.) |           |          | Brownsville,<br>Tex.<br>(7 m.) |           |          | Buffalo,<br>N. Y.<br>(230 m.) |           |          | Burlington,<br>Vt.<br>(132 m.) |           |          | Charleston,<br>S. C.<br>(17 m.) |           |          | Cincinnati,<br>Ohio<br>(152 m.) |           |          | Denver,<br>Colo.<br>(1,627 m.) |           |          | El Paso,<br>Tex.<br>(1,196 m.) |     |     |
|----------------------------------|------------------------------|-----------|----------|---------------------------------------|-----------|----------|-----------------------------|-----------|----------|----------------------------------|-----------|----------|----------------------------------|-----------|----------|-----------------------------|-----------|----------|--------------------------------|-----------|----------|-------------------------------|-----------|----------|--------------------------------|-----------|----------|---------------------------------|-----------|----------|---------------------------------|-----------|----------|--------------------------------|-----------|----------|--------------------------------|-----|-----|
|                                  | Observations                 | Direction | Velocity | Observations                          | Direction | Velocity | Observations                | Direction | Velocity | Observations                     | Direction | Velocity | Observations                     | Direction | Velocity | Observations                | Direction | Velocity | Observations                   | Direction | Velocity | Observations                  | Direction | Velocity | Observations                   | Direction | Velocity | Observations                    | Direction | Velocity | Observations                    | Direction | Velocity | Observations                   | Direction | Velocity |                                |     |     |
| Surface.....                     | 27                           | 303       | 1.8      | 30                                    | 49        | 1.2      | 29                          | 283       | 2.9      | 31                               | 250       | 3.9      | 31                               | 273       | 3.2      | 29                          | 344       | 0.8      | 26                             | 125       | 1.6      | 29                            | 253       | 5.6      | 31                             | 204       | 2.0      | 27                              | 302       | 1.6      | 28                              | 266       | 1.9      | 31                             | 192       | 0.4      | 30                             | 5   | 1.5 |
| 500.....                         | 27                           | 275       | 2.1      | 30                                    | 49        | 1.2      | 29                          | 288       | 3.8      | 31                               | 250       | 3.9      | 31                               | 273       | 3.2      | 29                          | 344       | 0.8      | 26                             | 125       | 1.6      | 29                            | 253       | 5.6      | 31                             | 204       | 2.0      | 27                              | 302       | 1.6      | 28                              | 266       | 1.9      | 31                             | 192       | 0.4      | 30                             | 5   | 1.5 |
| 1,000.....                       | 22                           | 253       | 6.3      | 30                                    | 49        | 1.2      | 29                          | 283       | 2.9      | 31                               | 250       | 3.9      | 31                               | 273       | 3.2      | 29                          | 344       | 0.8      | 26                             | 125       | 1.6      | 29                            | 253       | 5.6      | 31                             | 204       | 2.0      | 27                              | 302       | 1.6      | 28                              | 266       | 1.9      | 31                             | 192       | 0.4      | 30                             | 5   | 1.5 |
| 1,500.....                       | 22                           | 253       | 6.3      | 30                                    | 49        | 1.2      | 29                          | 283       | 2.9      | 31                               | 250       | 3.9      | 31                               | 273       | 3.2      | 29                          | 344       | 0.8      | 26                             | 125       | 1.6      | 29                            | 253       | 5.6      | 31                             | 204       | 2.0      | 27                              | 302       | 1.6      | 28                              | 266       | 1.9      | 31                             | 192       | 0.4      | 30                             | 5   | 1.5 |
| 2,000.....                       | 19                           | 264       | 8.6      | 30                                    | 81        | 0.9      | 24                          | 283       | 9.0      | 29                               | 292       | 8.1      | 29                               | 300       | 10.9     | 28                          | 177       | 0.9      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |
| 2,500.....                       | 19                           | 263       | 9.2      | 28                                    | 264       | 1.9      | 24                          | 280       | 11.2     | 29                               | 296       | 9.1      | 26                               | 301       | 12.9     | 25                          | 180       | 0.8      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |
| 3,000.....                       | 18                           | 259       | 8.6      | 25                                    | 271       | 4.8      | 22                          | 280       | 12.8     | 28                               | 304       | 9.3      | 25                               | 302       | 14.0     | 24                          | 245       | 0.7      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |
| 4,000.....                       | 18                           | 262       | 11.7     | 24                                    | 252       | 9.9      | 16                          | 276       | 15.9     | 26                               | 304       | 10.2     | 22                               | 303       | 17.0     | 20                          | 343       | 2.5      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |
| 5,000.....                       | 14                           | 278       | 12.3     | 22                                    | 250       | 10.7     | 12                          | 279       | 18.6     | 25                               | 301       | 9.7      | 18                               | 304       | 20.8     | 15                          | 351       | 1.6      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |
| 6,000.....                       | 11                           | 277       | 15.3     | 19                                    | 253       | 13.7     | 10                          | 282       | 21.3     | 22                               | 310       | 9.9      | 13                               | 318       | 19.8     | 14                          | 300       | 1.6      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |
| 8,000.....                       | 11                           | 277       | 15.3     | 19                                    | 253       | 13.7     | 10                          | 282       | 21.3     | 22                               | 310       | 9.9      | 13                               | 318       | 19.8     | 14                          | 300       | 1.6      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |
| 10,000.....                      | 11                           | 277       | 15.3     | 19                                    | 253       | 13.7     | 10                          | 282       | 21.3     | 22                               | 310       | 9.9      | 13                               | 318       | 19.8     | 14                          | 300       | 1.6      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |
| 12,000.....                      | 11                           | 277       | 15.3     | 19                                    | 253       | 13.7     | 10                          | 282       | 21.3     | 22                               | 310       | 9.9      | 13                               | 318       | 19.8     | 14                          | 300       | 1.6      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |
| 14,000.....                      | 11                           | 277       | 15.3     | 19                                    | 253       | 13.7     | 10                          | 282       | 21.3     | 22                               | 310       | 9.9      | 13                               | 318       | 19.8     | 14                          | 300       | 1.6      | 12                             | 235       | 3.6      | 11                            | 289       | 12.4     | 13                             | 280       | 14.6     | 25                              | 289       | 10.3     | 22                              | 286       | 10.9     | 31                             | 291       | 0.5      | 29                             | 215 | 2.0 |

| Altitude<br>(meters)<br>m. s. l. | Ely,<br>Nev.<br>(1,910 m.) |           |          | Grand Junction,<br>Colo.<br>(1,413 m.) |           |          | Greensboro,<br>N. C.<br>(271 m.) |           |          | Havre,<br>Mont.<br>(767 m.) |           |          | Jacksonville,<br>Fla.<br>(16 m.) |           |          | Joliet,<br>Ill.<br>(178 m.) |           |          | Las Vegas,<br>Nev.<br>(573 m.) |           |          | Little Rock,<br>Ark.<br>(88 m.) |           |          | Medford,<br>Oreg.<br>(410 m.) |           |          | Miami,<br>Fla.<br>(15 m.) |           |          | Mobile,<br>Ala.<br>(66 m.) |           |          | Nashville,<br>Tenn.<br>(194 m.) |           |          | New York,<br>N. Y.<br>(15 m.) |     |      |
|----------------------------------|----------------------------|-----------|----------|--|-----------|----------|----------------------------------|-----------|----------|-----------------------------|-----------|----------|----------------------------------|-----------|----------|-----------------------------|-----------|----------|--------------------------------|-----------|----------|---------------------------------|-----------|----------|-------------------------------|-----------|----------|---------------------------|-----------|----------|----------------------------|-----------|----------|---------------------------------|-----------|----------|-------------------------------|-----|------|
|                                  | Observations               | Direction | Velocity | Observations                           | Direction | Velocity | Observations                     | Direction | Velocity | Observations                | Direction | Velocity | Observations                     | Direction | Velocity | Observations                | Direction | Velocity | Observations                   | Direction | Velocity | Observations                    | Direction | Velocity | Observations                  | Direction | Velocity | Observations              | Direction | Velocity | Observations               | Direction | Velocity | Observations                    | Direction | Velocity |                               |     |      |
| Surface.....                     | 29                         | 2         | 1.3      | 29                                     | 298       | 0.9      | 28                               | 240       | 1.2      | 31                          | 253       | 3.8      | 28                               | 1         | 0.9      | 31                          | 254       | 3.5      | 31                             | 44        | 2.4      | 23                              | 301       | 0.7      | 26                            | 338       | 0.3      | 30                        | 95        | 1.1      | 24                         | 298       | 0.6      | 26                              | 301       | 1.1      | 30                            | 288 | 5.4  |
| 500.....                         | 29                         | 2         | 1.3      | 29                                     | 298       | 0.9      | 28                               | 240       | 1.2      | 31                          | 253       | 3.8      | 28                               | 1         | 0.9      | 31                          | 254       | 3.5      | 31                             | 44        | 2.4      | 23                              | 301       | 0.7      | 26                            | 338       | 0.3      | 30                        | 95        | 1.1      | 24                         | 298       | 0.6      | 26                              | 301       | 1.1      | 30                            | 288 | 5.4  |
| 1,000.....                       | 29                         | 2         | 1.3      | 29                                     | 298       | 0.9      | 28                               | 240       | 1.2      | 31                          | 253       | 3.8      | 28                               | 1         | 0.9      | 31                          | 254       | 3.5      | 31                             | 44        | 2.4      | 23                              | 301       | 0.7      | 26                            | 338       | 0.3      | 30                        | 95        | 1.1      | 24                         | 298       | 0.6      | 26                              | 301       | 1.1      | 30                            | 288 | 5.4  |
| 1,500.....                       | 29                         | 2         | 1.3      | 29                                     | 298       | 0.9      | 28                               | 240       | 1.2      | 31                          | 253       | 3.8      | 28                               | 1         | 0.9      | 31                          | 254       | 3.5      | 31                             | 44        | 2.4      | 23                              | 301       | 0.7      | 26                            | 338       | 0.3      | 30                        | 95        | 1.1      | 24                         | 298       | 0.6      | 26                              | 301       | 1.1      | 30                            | 288 | 5.4  |
| 2,000.....                       | 29                         | 349       | 1.1      | 29                                     | 350       | 1.0      | 26                               | 289       | 11.2     | 29                          | 294       | 9.8      | 25                               | 274       | 7.8      | 24                          | 294       | 12.6     | 28                             | 33        | 0.9      | 16                              | 288       | 8.0      | 22                            | 161       | 1.5      | 24                        | 238       | 0.9      | 22                         | 278       | 6.7      | 17                              | 293       | 8.5      | 23                            | 290 | 12.7 |
| 2,500.....                       | 29                         | 349       | 1.1      | 29                                     | 350       | 1.0      | 26                               | 289       | 11.2     | 29                          | 294       | 9.8      | 25                               | 274       | 7.8      | 24                          | 294       | 12.6     | 28                             | 33        | 0.9      | 16                              | 288       | 8.0      | 22                            | 161       | 1.5      | 24                        | 238       | 0.9      | 22                         | 278       | 6.7      | 17                              | 293       | 8.5      | 23                            | 290 | 12.7 |
| 3,000.....                       | 29                         | 349       | 1.1      | 29                                     | 350       | 1.0      | 26                               | 289       | 11.2     | 29                          | 294       | 9.8      | 25                               | 274       | 7.8      | 24                          | 294       | 12.6     | 28                             | 33        | 0.9      | 16                              | 288       | 8.0      | 22                            | 161       | 1.5      | 24                        | 238       | 0.9      | 22                         | 278       | 6.7      | 17                              | 293       | 8.5      | 23                            | 290 | 12.7 |
| 4,000.....                       | 28                         | 164       | 0.6      | 24                                     | 231       | 2.4      | 21                               | 281       | 16.4     | 26                          | 301       | 11.2     | 23                               | 276       | 10.0     | 22                          | 295       | 15.8     | 27                             | 9         | 0.9      | 14                              | 291       | 9.9      | 20                            | 109       | 0.7      | 19                        | 231       | 1.4      | 18                         | 275       | 8.2      | 17                              | 293       | 11.3     | 17                            | 292 | 12.5 |
| 5,000.....                       | 22                         | 210       | 0.6      | 17                                     | 259       | 4.2      | 15                               | 283       | 17.0     | 18                          | 298       | 10.2     | 20                               | 284       | 12.5     | 13                          | 308       | 17.1     | 24                             | 320       | 2.6      | 12                              | 286       | 17.8     | 12                            | 16        | 8.5      | 14                        | 294       | 5.6      | 13                         | 290       | 7.3      | 13                              | 291       | 17.6     | 12                            | 297 | 20.4 |
| 6,000.....                       | 19                         | 324       | 2.8      | 12                                     | 261       | 4.1      | 14                               | 283       | 19.8     | 13                          | 288       | 10.4     | 20                               | 280       | 15.2     | 11                          | 309       | 21.0     | 23                             | 331       | 4.3      | 12                              | 286       | 17.8     | 12                            | 16        | 8.5      | 14                        | 294       | 5.6      | 13                         | 290       | 7.3      | 13                              | 291       | 17.6     | 12                            | 297 | 20.4 |
| 8,000.....                       | 18                         | 331       | 3.5      | 11                                     | 283       | 5.5      | 12                               | 275       | 20.6     | 12                          | 275       | 20.6     | 12                               | 275       | 20.6     | 12                          | 275       | 20.6     | 12                             | 275       | 20.6     | 12                              | 275       | 20.6     | 12                            | 275       | 20.6     | 12                        | 275       | 20.6     | 12                         | 275       | 20.6     | 12                              | 275       | 20.6     | 12                            | 275 | 20.6 |
| 10,000.....                      | 18                         | 331       | 3.5      | 11                                     | 283       | 5.5      | 12                               | 275       | 20.6     | 12                          | 275       | 20.6     | 12                               | 275       | 20.6     | 12                          | 275       | 20.6     | 12                             | 275       | 20.6     | 12                              | 275       | 20.6     | 12                            | 275       | 20.6     | 12                        | 275       | 20.6     | 12                         | 275       | 20.6     | 12                              | 275       | 20.6     | 12                            | 275 | 20.6 |
| 12,000.....                      | 18                         | 331       | 3.5      | 11                                     | 283       | 5.5      | 12                               | 275       | 20.6     | 12                          | 275       | 20.6     | 12                               | 275       | 20.6     | 12                          | 275       | 20.6     | 12                             | 275       | 20.6     | 12                              | 275       | 20.6     | 12                            | 275       | 20.6     | 12                        | 275       | 20.6     | 12                         | 275       | 20.6     | 12                              | 275       | 20.6     | 12                            | 275 | 20.6 |
| 14,000.....                      | 18                         | 331       | 3.5      | 11                                     | 283       | 5.5      | 12                               | 275       | 20.6     | 12                          | 275       | 20.6     | 12                               | 275       | 20.6     | 12                          | 275       | 20.6     | 12                             | 275       | 20.6     | 12                              | 275       | 20.6     | 12                            | 275       | 20.6     | 12                        | 275       | 20.6     | 12                         | 275       | 20.6     | 12                              | 275       | 20.6     | 12                            | 275 | 20.6 |

| Altitude<br>(meters)<br>m. s. l. | Oakland,<br>Calif.<br>(8 m.) |           |          | Oklahoma,<br>City, Okla.<br>(402 m.) |           |          | Omaha,<br>Nebr.<br>(306 m.) |           |          | Phoenix,<br>Ariz.<br>(388 m.) |           |          | Rapid City,<br>S. Dak.<br>(982 m.) |           |          | St. Louis,<br>Mo.<br>(181 m.) |           |          | St. Paul,<br>Minn.<br>(225 m.) |           |          | San Antonio,<br>Tex.<br>(240 m.) |           |          | San Diego,<br>Calif.<br>(15 m.) |           |          | Sault Ste. Marie,<br>Mich.<br>(230 m.) |           |          | Seattle,<br>Wash.<br>(12 m.) |           |          | Spokane,<br>Wash.<br>(603 m.) |           |          | Washington,<br>D. C.<br>(24 m.) |     |     |
|----------------------------------|------------------------------|-----------|----------|--------------------------------------|-----------|----------|-----------------------------|-----------|----------|-------------------------------|-----------|----------|------------------------------------|-----------|----------|-------------------------------|-----------|----------|--------------------------------|-----------|----------|----------------------------------|-----------|----------|---------------------------------|-----------|----------|--|-----------|----------|------------------------------|-----------|----------|-------------------------------|-----------|----------|---------------------------------|-----|-----|
|                                  | Observations                 | Direction | Velocity | Observations                         | Direction | Velocity | Observations                | Direction | Velocity | Observations                  | Direction | Velocity | Observations                       | Direction | Velocity | Observations                  | Direction | Velocity | Observations                   | Direction | Velocity | Observations                     | Direction | Velocity | Observations                    | Direction | Velocity | Observations                           | Direction | Velocity | Observations                 | Direction | Velocity | Observations                  | Direction | Velocity |                                 |     |     |
| Surface.....                     | 31                           | 296       | 0.9      | 25                                   | 347       | 1.9      | 31                          | 242       | 1.4      | 31                            | 91        | 0.3      | 31                                 | 337       | 4.3      | 28                            | 295       | 1.8      | 31                             | 262       | 3.2      | 26                               | 27        | 0.6      | 28                              | 251       | 1.8      | 27                                     | 276       | 2.0      | 28                           | 144       | 0.9      | 27                            | 274       | 0.5      | 28                              | 289 | 1.9 |
| 500.....                         | 31                           | 28        | 1.5      | 25                                   | 355       | 1.5      | 31                          | 236       | 2.2      | 31                            | 71        | 0.4      | 31                                 | 333       | 4.5      | 28                            | 287       | 3.2      | 31                             | 261       | 5.6      | 26                               | 27        | 0.6      | 28                              | 250       | 1.8      | 27                                     | 275       | 2.1      | 28                           | 145       | 1.0      | 27                            | 275       | 0.6      | 28                              | 290 | 2.0 |
| 1,000.....                       | 27                           | 23        | 2.7      | 24                                   | 317       | 1.4      | 31                          | 263       | 4.4      | 31                            | 98        | 0.8      | 31                                 | 333       | 4.5      | 28                            | 288       | 4.9      | 31                             | 268       | 8.7      | 27                               |           |          |                                 |           |          |  |           |          |                              |           |          |                               |           |          |                                 |     |     |

AEROLOGICAL OBSERVATIONS FOR THE YEAR 1943<sup>1</sup>

TABLE 2.—Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during December, 1943. Directions given in degrees from North (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second—Continued

| Altitude<br>(meters)<br>m. s. l. | Abilene,<br>Tex.<br>(538 m.)          | Albuquerque,<br>N. Mex.<br>(1,630 m.) | Atlanta,<br>Ga.<br>(299 m.)           | Billings,<br>Mont.<br>(1,095 m.)      | Bismarck,<br>N. Dak.<br>(512 m.)      | Boise,<br>Idaho<br>(870 m.)           | Brownsville,<br>Tex.<br>(7 m.)        | Buffalo,<br>N. Y.<br>(220 m.)         | Burlington,<br>Vt.<br>(132 m.)        | Charleston,<br>S. C.<br>(17 m.)       | Cincinnati,<br>Ohio<br>(162 m.)       | Denver,<br>Colo.<br>(1,627 m.)        | El Paso,<br>Tex.<br>(1,196 m.)        |
|----------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
|                                  | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity |
| Surface.....                     | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 500.....                         | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 1,000.....                       | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 1,500.....                       | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 2,000.....                       | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 2,500.....                       | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 3,000.....                       | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 4,000.....                       | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 5,000.....                       | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 6,000.....                       | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 8,000.....                       | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 10,000.....                      | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 12,000.....                      | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |
| 14,000.....                      | 356                                   | 186                                   | 1.5                                   | 362                                   | 240                                   | 1.8                                   | 341                                   | 277                                   | 1.5                                   | 356                                   | 285                                   | 1.8                                   | 356                                   |

| Altitude<br>(meters)<br>m. s. l. | Ely, Nev.<br>(1,910 m.)               | Grand Junction,<br>Colo.<br>(1,413 m.) | Greensboro,<br>N. C.<br>(271 m.)      | Havre,<br>Mont.<br>(767 m.)           | Jacksonville,<br>Fla.<br>(16 m.)      | Joliet, Ill.<br>(178 m.)              | Las Vegas,<br>Nev.<br>(573 m.)        | Little Rock,<br>Ark.<br>(88 m.)       | Medford,<br>Oreg.<br>(410 m.)         | Miami,<br>Fla.<br>(15 m.)             | Mobile,<br>Ala.<br>(66 m.)            | Nashville,<br>Tenn.<br>(194 m.)       | New York<br>N. Y.<br>(15 m.)          |
|----------------------------------|---------------------------------------|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
|                                  | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity  | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity |
| Surface.....                     | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 500.....                         | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 1,000.....                       | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 1,500.....                       | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 2,000.....                       | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 2,500.....                       | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 3,000.....                       | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 4,000.....                       | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 5,000.....                       | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 6,000.....                       | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 8,000.....                       | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 10,000.....                      | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 12,000.....                      | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |
| 14,000.....                      | 358                                   | 251                                    | 1.1                                   | 353                                   | 311                                   | 1.3                                   | 339                                   | 246                                   | 1.4                                   | 336                                   | 270                                   | 2.1                                   | 351                                   |

| Altitude<br>(meters)<br>m. s. l. | Oakland,<br>Calif.<br>(8 m.)          | Oklahoma<br>City, Okla.<br>(402 m.)   | Omaha,<br>Nebr.<br>(306 m.)           | Phoenix,<br>Ariz.<br>(388 m.)         | Rapid City,<br>S. Dak.<br>(982 m.)    | St. Louis,<br>Mo.<br>(181 m.)         | St. Paul,<br>Minn.<br>(225 m.)        | San Antonio,<br>Tex.<br>(240 m.)      | San Diego,<br>Calif.<br>(15 m.)       | Sault Ste.<br>Marie,<br>Mich.<br>(230 m.) | Seattle,<br>Wash.<br>(12 m.)          | Spokane,<br>Wash.<br>(603 m.)         | Washing-<br>ton, D. C.<br>(24 m.)     |
|----------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---|---------------------------------------|---------------------------------------|---------------------------------------|
|                                  | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity     | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity | Observations<br>Direction<br>Velocity |
| Surface.....                     | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 500.....                         | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 1,000.....                       | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 1,500.....                       | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 2,000.....                       | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 2,500.....                       | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 3,000.....                       | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 4,000.....                       | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 5,000.....                       | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 6,000.....                       | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 8,000.....                       | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 10,000.....                      | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 12,000.....                      | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |
| 14,000.....                      | 357                                   | 264                                   | 4.1                                   | 330                                   | 183                                   | 2.0                                   | 338                                   | 214                                   | 0.7                                   | 365                                       | 255                                   | 0.7                                   | 353                                   |

<sup>1</sup> All data are based on observations during 12 months. At some stations data were missing during 1 or 2 months at higher levels. Data were not published for any level where observations were missing for more than 1 month in the same season or more than 2 months during the year.

TABLE 3.—Maximum free-air wind velocities, (m. p. s.), for different sections of the United States, based on pilot-balloon observations during December, 1943

| Section                    | Surface to 2,500 meters (m. s. l.) |                |                              |      |                      | Above 2,500 to 5,000 meters (m. s. l.) |                |                              |      |                   | Above 5,000 meters (m. s. l.) |                |                              |      |                    |
|----------------------------|------------------------------------|----------------|------------------------------|------|----------------------|--|----------------|------------------------------|------|-------------------|-------------------------------|----------------|------------------------------|------|--------------------|
|                            | Max. velocity                      | Direc-<br>tion | Altitude<br>(m.)<br>m. s. l. | Date | Station              | Max. velocity                          | Direc-<br>tion | Altitude<br>(m.)<br>m. s. l. | Date | Station           | Max. velocity                 | Direc-<br>tion | Altitude<br>(m.)<br>m. s. l. | Date | Station            |
|                            |                                    |                |                              |      |                      |  |                |                              |      |                   |                               |                |                              |      |                    |
| Northeast <sup>1</sup>     | 51.2                               | NW.            | 2,080                        | 28   | Hartford, Conn.      | 57.5                                   | WNW.           | 4,600                        | 5    | Boston, Mass.     | 64.8                          | WSW.           | 8,060                        | 15   | Phillipsburg, Pa.  |
| East Central <sup>2</sup>  | 47.6                               | NW.            | 1,800                        | 11   | Greensboro, N. C.    | 58.8                                   | W.             | 4,780                        | 13   | Norfolk, Va.      | 82.0                          | WSW.           | 9,350                        | 15   | Huntington, W. Va. |
| Southeast <sup>3</sup>     | 32.1                               | WNW.           | 2,420                        | 12   | Atlanta, Ga.         | 39.8                                   | WNW.           | 4,960                        | 22   | Charleston, S. O. | 57.0                          | WSW.           | 16,280                       | 14   | Miami, Fla.        |
| North Central <sup>4</sup> | 52.2                               | NNW.           | 1,610                        | 19   | Duluth, Minn.        | 50.0                                   | NW.            | 4,920                        | 11   | Bismarck, N. Dak. | 65.0                          | W.             | 11,770                       | 9    | Bismarck, N. Dak.  |
| Central <sup>5</sup>       | 40.0                               | WNW.           | 2,440                        | 11   | Moline, Ill.         | 53.6                                   | NW.            | 4,770                        | 10   | Joliet, Ill.      | 71.6                          | WNW.           | 11,140                       | 28   | Wichita, Kans.     |
| South Central <sup>6</sup> | 35.6                               | WNW.           | 2,100                        | 31   | Tulsa, Okla.         | 40.0                                   | SW.            | 4,360                        | 27   | Del Rio, Tex.     | 68.0                          | W.             | 10,060                       | 30   | Big Spring, Tex.   |
| Northwest <sup>7</sup>     | 42.0                               | W.             | 2,480                        | 3    | Havre, Mont.         | 54.0                                   | NNW.           | 5,000                        | 8    | Burns, Oreg.      | 84.6                          | NNW.           | 6,760                        | 8    | Burns, Oreg.       |
| West Central <sup>8</sup>  | 35.4                               | NE.            | 2,080                        | 9    | Sacramento, Calif.   | 44.6                                   | SE.            | 5,520                        | 16   | Oakland, Calif.   | 80.7                          | ENE.           | 9,230                        | 9    | Winnemucca, Nev.   |
| Southwest <sup>9</sup>     | 33.1                               | E.             | 1,850                        | 9    | Albuquerque, N. Mex. | 44.2                                   | W.             | 4,370                        | 7    | Raton, N. Mex.    | 63.0                          | W.             | 10,280                       | 29   | Las Vegas, Nev.    |

<sup>1</sup> Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.

<sup>2</sup> Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.

<sup>3</sup> South Carolina, Georgia, Florida, and Alabama.

<sup>4</sup> Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.

<sup>5</sup> Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.

<sup>6</sup> Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.

<sup>7</sup> Montana, Idaho, Washington, and Oregon.

<sup>8</sup> Wyoming, Colorado, Utah, northern Nevada, and northern California.

<sup>9</sup> Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

TABLE 3.—Maximum free-air wind velocities (m. p. s.) for different sections of the United States, based on pilot-balloon observations during year 1943

| Section                    | Surface to 2,500 meters (m. s. l.) |           |                          |         |                       | Above 2,500 to 5,000 meters (m. s. l.) |           |                          |         |                            | Above 5,000 meters (m. s. l.) |           |                          |         |                    |
|----------------------------|------------------------------------|-----------|--------------------------|---------|-----------------------|--|-----------|--------------------------|---------|----------------------------|-------------------------------|-----------|--------------------------|---------|--------------------|
|                            | Max. velocity                      | Direction | Altitude (m)<br>m. s. l. | Date    | Station               | Max. velocity                          | Direction | Altitude (m)<br>m. s. l. | Date    | Station                    | Max. velocity                 | Direction | Altitude (m)<br>m. s. l. | Date    | Station            |
| Northeast <sup>1</sup>     | 60.0                               | W.        | 2,290                    | Apr. 28 | Phillipsburg, Pa.     | 57.5                                   | WNW.      | 4,600                    | Dec. 5  | Boston, Mass.              | 90.5                          | W.        | 13,550                   | Jan. 29 | Portland, Maine.   |
| East Central <sup>2</sup>  | 47.6                               | NW.       | 1,800                    | Dec. 11 | Greensboro, N. C.     | 62.4                                   | W.        | 5,000                    | Jan. 4  | Greensboro, N. C.          | 82.0                          | WSW.      | 9,350                    | Dec. 15 | Huntington, W. Va. |
| Southeast <sup>3</sup>     | 41.3                               | NW.       | 1,050                    | Feb. 14 | Spartanburg, S. C.    | 58.0                                   | W.        | 4,960                    | Feb. 14 | Charleston, S. C.          | 66.0                          | W.        | 11,900                   | Feb. 7  | Miami, Fla.        |
| North Central <sup>4</sup> | 52.2                               | NNW.      | 1,610                    | Dec. 19 | Duluth, Minn.         | 62.9                                   | WNW.      | 5,000                    | Mar. 26 | International Falls, Minn. | 73.8                          | WNW.      | 12,420                   | Nov. 20 | Detroit, Mich.     |
| Central <sup>5</sup>       | 62.0                               | SSW.      | 2,380                    | Mar. 30 |                       | Dodge City, Kans.                      | 54.4      | W.                       | 2,550   | Mar. 17                    | Des Moines, Iowa.             | 75.2      | WNW.                     | 14,700  | Jan. 10            |
| South Central <sup>6</sup> | 52.4                               | NW.       | 1,380                    | Apr. 13 | Tulsa, Okla.          | 55.3                                   | NW.       | 5,000                    | Feb. 6  | Waco, Tex.                 | 113.0                         | SW.       | 17,090                   | Jan. 23 | Amarillo, Tex.     |
| Northwest <sup>7</sup>     | 54.6                               | S.        | 1,210                    | Oct. 24 | Tatoosh Island, Wash. | 60.0                                   | WNW.      | 3,700                    | Jan. 15 | Burns, Oreg.               | 84.6                          | NNW.      | 6,760                    | Dec. 8  | Burns, Oreg.       |
| West Central <sup>8</sup>  | 60.8                               | W.        | 2,480                    | Jan. 20 | Cheyenne, Wyo.        | 67.0                                   | WNW.      | 4,700                    | Jan. 15 | Ely, Nev.                  | 80.7                          | ENE.      | 9,230                    | Dec. 9  | Winnemucca, Nev.   |
| Southwest <sup>9</sup>     | 48.2                               | SW.       | 2,290                    | Mar. 18 | Winslow, Ariz.        | 62.0                                   | W.        | 4,800                    | Mar. 15 | Roswell, N. Mex.           | 85.0                          | WSW.      | 9,110                    | Apr. 12 | El Paso, Tex.      |

<sup>1</sup> Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.

<sup>2</sup> Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.

<sup>3</sup> South Carolina, Georgia, Florida, and Alabama.

<sup>4</sup> Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.

<sup>5</sup> Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.

<sup>6</sup> Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.

<sup>7</sup> Montana, Idaho, Washington, and Oregon.

<sup>8</sup> Wyoming, Colorado, Utah, northern Nevada and northern California.

<sup>9</sup> Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

## RIVER STAGES AND FLOODS

By C. R. JORDAN

**P**RECIPITATION during December 1943, was below normal over most of the northern and eastern parts of the country except locally in the South Atlantic States. On the Pacific coast normal conditions were completely reversed. Seattle, Wash., with a normal of 5.60 inches, received 1.27 inches, while San Diego, Calif., with a normal of 1.87 had 7.60 inches. Seattle had the driest December of record while the 7.60 inches at San Diego has been exceeded only twice in more than 90 years.

The seasonal snow cover had accumulated at the end of December to considerable depths in northern New England, in the Adirondacks, northern Michigan, and in the Rocky Mountains and western coastal ranges. Some of the greater depths in the Far West were 30 inches at Cumbres, Colo.; 41 inches at Silver Lake, Utah; 72 inches at Paradise Inn, Wash.; and 31 inches at Huntington Lake, Calif.

Conditions were extremely unfavorable for the maintenance of stream flow and ground-water levels. Stream flow was below normal in more than 80 percent of the

country. December was the fourth consecutive month with no flooding of consequence. The Saluda River just reached flood stage at Pelzer, S. C., on December 27, and the Luckiamute River rose to a stage of 26.4 feet, 1.4 feet above flood stage, at Suver, Oreg., on December 5, as a result of moderately heavy rain along the northern Pacific coast on December 3-4. No damage resulted at either place.

## FLOOD-STAGE REPORT FOR DECEMBER 1943

[All dates in December]

| River and station             | Flood stage | Above flood stages—dates |     | Crest       |      |
|-------------------------------|-------------|--------------------------|-----|-------------|------|
|                               |             | From—                    | To— | Stage       | Date |
| ATLANTIC SLOPE DRAINAGE       | <i>Feet</i> |                          |     | <i>Feet</i> |      |
| Saluda: Pelzer, S. C.-----    | 6           | 27                       | 27  | 6           | 27   |
| PACIFIC SLOPE DRAINAGE        |             |                          |     |             |      |
| <i>Columbia Basin</i>         |             |                          |     |             |      |
| Luckiamute: Suver, Oreg.----- | 25          | 4                        | 5   | 26.4        | 5    |

## CLIMATOLOGICAL DATA

## CONDENSED CLIMATOLOGICAL SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS

[For description of tables and charts, see REVIEW January 1943, p. 16]

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

| Section           | Temperature     |                           |                   |         |      |                     |        |      | Precipitation   |                           |                        |        |                      |        |
|-------------------|-----------------|---------------------------|-------------------|---------|------|---------------------|--------|------|-----------------|---------------------------|------------------------|--------|----------------------|--------|
|                   | Section average | Departure from the normal | Monthly extremes  |         |      |                     |        |      | Section average | Departure from the normal | Greatest monthly       |        | Least monthly        |        |
|                   |                 |                           | Station           | Highest | Date | Station             | Lowest | Date |                 |                           | Station                | Amount | Station              | Amount |
|                   | °F.             | °F.                       |                   | °F.     |      |                     | °F.    |      | In.             | In.                       |                        | In.    |                      | In.    |
| Alabama           | 47.3            | -0.4                      | Eufaula           | 83      | 9    | Fayette             | 9      | 16   | 3.50            | -1.91                     | Robertsdale            | 5.72   | Samantha             | 1.11   |
| Arizona           | 42.6            | -2.3                      | 2 stations        | 80      | 13   | Alpine              | -8     | 28   | 1.50            | +1.22                     | Natural Bridge         | 4.14   | Holbrook             | 1.23   |
| Arkansas          | 40.7            | -2.1                      | Arkadelphia       | 82      | 9    | White Rock          | -5     | 15   | 3.43            | -1.77                     | Mena                   | 5.58   | Corning              | 1.88   |
| California        | 46.2            | +1.9                      | 4 stations        | 83      | 12   | Ellery Lake         | -8     | 31   | 3.30            | -1.82                     | Mount Wilson A. S.     | 12.86  | Angiola              | 1.33   |
| Colorado          | 26.8            | +1.9                      | 3 stations        | 65      | 14   | 2 stations          | -25    | 18   | .77             | -1.13                     | Lime                   | 2.96   | Gunnison             | .02    |
| Florida           | 59.4            | -1.5                      | LaBelle           | 89      | 25   | Vernon              | 14     | 18   | 1.62            | -1.18                     | Crestview              | 6.43   | Venus                | .00    |
| Georgia           | 47.4            | -1.4                      | Waycross          | 87      | 9    | Blairsville         | 2      | 17   | 3.80            | -1.51                     | Dover                  | 6.30   | Brunswick            | 2.36   |
| Idaho             | 27.8            | +1.3                      | Grandview         | 65      | 3    | Landmark            | -35    | 28   | 1.15            | -1.92                     | Deception Creek        | 7.93   | Challis              | .12    |
| Illinois          | 29.3            | -1.8                      | McLeansboro       | 69      | 5    | Springfield, A.P.   | -12    | 15   | 1.27            | -1.84                     | Anna                   | 2.92   | Wheaton              | .7     |
| Indiana           | 30.0            | -2.3                      | Madison           | 67      | 14   | LaPorte             | -10    | 15   | 1.16            | -1.58                     | North Vernon           | 2.65   | Gary                 | .09    |
| Iowa              | 26.2            | +1.9                      | 2 stations        | 65      | 4    | 7 stations          | -13    | 13   | .52             | -1.66                     | Cedar Rapids           | 1.38   | 12 stations          | .7     |
| Kansas            | 30.5            | -2.4                      | 3 stations        | 68      | 11   | Centralla           | -21    | 15   | 1.50            | +1.63                     | Marion                 | 3.65   | Atwood               | .7     |
| Kentucky          | 35.2            | -2.6                      | Williamsburg      | 68      | 9    | Farmers             | -1     | 16   | 2.20            | -1.65                     | Mammoth Cave           | 3.79   | Oneonta              | 1.07   |
| Louisiana         | 31.5            | -1.0                      | N. Livingston     | 86      | 10   | Aradia              | 10     | 16   | 5.22            | -1.12                     | Crowley                | 8.37   | Natchitoches         | 1.46   |
| Maryland-Delaware | 34.5            | -1.9                      | 2 stations        | 69      | 3    | Oakland, Md.        | -15    | 16   | 1.41            | -1.74                     | Easton, Md.            | 2.50   | Ocean City, Md.      | .71    |
| Michigan          | 24.3            | -1.4                      | do.               | 52      | 11   | Kenton              | -25    | 14   | .82             | -1.22                     | Deer Park              | 5.07   | Iron Mountain        | .04    |
| Minnesota         | 19.9            | +4.0                      | do.               | 52      | 14   | Big Falls           | -28    | 23   | .07             | -1.69                     | Pigeon River Bridge    | .44    | 9 stations           | .00    |
| Mississippi       | 47.5            | -1.9                      | 6 stations        | 82      | 16   | Tupelo              | 9      | 16   | 3.91            | -1.39                     | Woodville              | 7.00   | Rochdale             | 2.02   |
| Missouri          | 31.3            | -3.0                      | Doniphan          | 72      | 4    | Sweet Springs       | -20    | 15   | 2.10            | -1.09                     | Mexico                 | 3.93   | 2 stations           | .76    |
| Montana           | 25.9            | +2.4                      | Roundup           | 69      | 3    | West Yellowstone    | -29    | 9    | .42             | -1.53                     | Heron                  | 5.08   | 16 stations          | .7     |
| Nebraska          | 29.3            | +2.1                      | Nenzel (near)     | 68      | 18   | Nenzel (near)       | -20    | 14   | .16             | -1.52                     | Falls City             | 1.95   | 21 stations          | .00    |
| Nevada            | 33.6            | +2.2                      | Overton           | 70      | 5    | San Jacinto         | -18    | 10   | .86             | -1.14                     | Lehman Caves           | 2.57   | 3 stations           | .00    |
| New England       | 21.7            | -4.8                      | Westbrook, Conn.  | 59      | 9    | Lemington, Vt.      | -37    | 24   | .99             | -2.32                     | First Conn. Lake, N.H. | 2.33   | Turners Falls, Mass. | .40    |
| New Jersey        | 31.1            | -2.7                      | Belleplain        | 62      | 9    | Runyon              | -10    | 24   | 1.41            | -2.14                     | Toms River             | 2.31   | Layton               | .22    |
| New Mexico        | 31.8            | -2.4                      | 2 stations        | 74      | 11   | Eagle Nest          | -29    | 20   | 1.42            | +1.70                     | Tucumcari No. 2        | 5.08   | 2 stations           | .00    |
| New York          | 23.3            | -3.5                      | do.               | 59      | 13   | 2 stations          | -34    | 13   | 1.11            | -1.83                     | Eden                   | 2.25   | Burdett              | .06    |
| North Carolina    | 41.8            | -1.8                      | Fayetteville      | 82      | 9    | Mount Mitchell      | -5     | 16   | 3.36            | -1.46                     | Hatteras               | 5.89   | Jefferson            | 1.06   |
| North Dakota      | 21.5            | +8.1                      | Center            | 65      | 3    | Langdon             | -22    | 14   | .12             | -1.36                     | Langdon                | .41    | 15 stations          | .7     |
| Ohio              | 29.4            | -2.3                      | 3 stations        | 63      | 12   | Bellefontaine       | -10    | 15   | 1.03            | -1.68                     | Gallipolis (near)      | 2.28   | Napoleon             | .24    |
| Oklahoma          | 36.2            | -3.8                      | Antlers           | 78      | 9    | Hooker              | -8     | 15   | 3.10            | +1.40                     | Bear Mountain Tower    | 5.22   | Herd                 | 1.06   |
| Oregon            | 33.6            | -1.1                      | Brookings         | 70      | 10   | Austin              | -10    | 9    | 1.68            | -2.20                     | Valsets                | 12.32  | Fremont              | .18    |
| Pennsylvania      | 28.4            | -3.0                      | Phoenixville      | 63      | 9    | Kane                | -23    | 15   | 1.12            | -1.96                     | Laurel Hill Tunnel     | 3.23   | Wellsville           | .45    |
| South Carolina    | 46.0            | -1.8                      | Conway            | 84      | 10   | 3 stations          | 7      | 16   | 3.94            | +1.33                     | Dillon                 | 5.32   | Greenville           | 1.89   |
| South Dakota      | 26.5            | +4.4                      | Ludlow            | 69      | 3    | Ottumwa             | -23    | 14   | .11             | -1.41                     | 2 stations             | .95    | 5 stations           | .11    |
| Tennessee         | 39.0            | -1.8                      | Coldwater         | 72      | 8    | Rugby               | -2     | 17   | .21             | -1.30                     | Waynesboro             | 5.19   | Crossville           | 2.3    |
| Texas             | 46.5            | -2.4                      | 2 stations        | 88      | 10   | Miami               | -2     | 29   | 2.11            | +1.55                     | Port Isabel            | 7.53   | Pecos                | .51    |
| Utah              | 29.6            | +2.5                      | St. George        | 64      | 4    | Woodruff            | -20    | 28   | .6              | -1.13                     | Silver Lake            | 2.56   | Woodside             | .01    |
| Virginia          | 37.1            | -1.0                      | Staunton          | 79      | 3    | 2 stations          | -3     | 15   | 2.17            | -1.89                     | Emory                  | 4.16   | Moores Creek Dam     | .00    |
| Washington        | 33.0            | -3                        | North Dalles A.P. | 72      | 3    | Republe             | -6     | 27   | 3.22            | -2.23                     | Higley Peak            | 22.67  | Rock Island          | .04    |
| West Virginia     | 32.1            | -2.6                      | 2 stations        | 66      | 15   | Bayard              | -15    | 16   | 1.96            | -1.31                     | Cranberry Glades       | 4.20   | Harpers Ferry        | .45    |
| Wisconsin         | 22.7            | +2.0                      | Wisconsin Dells   | 57      | 4    | Solon Springs       | -21    | 23   | .27             | -1.03                     | Darlington             | 1.08   | 9 stations           | .00    |
| Wyoming           | 24.6            | +2.4                      | Lagrange          | 69      | 4    | 2 stations          | -26    | 19   | .52             | -1.21                     | Beckler River          | 2.69   | Deaver               | .04    |
| Alaska (November) | 22.7            | +8.4                      | 2 stations        | 59      | 124  | Allakaket           | -42    | 1    | 4.06            | +1.30                     | Little Port Walter     | 40.43  | University           | .09    |
| Hawaii            | 71.3            | +1.9                      | Kaanapali         | 91      | 3    | Volcano Observatory | 45     | 21   | 6.46            | -2.45                     | Kukui, Maui            | 44.00  | 2 stations           | .00    |
| Puerto Rico       | 75.3            | +1.4                      | Dos Bocas         | 94      | 17   | Guineo Reservoir    | 50     | 11   | 3.49            | -1.24                     | La Mina (El Yunque)    | 14.90  | Coamo Dam            | .15    |

1 Other dates also.

## CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

| District and station   | Elevation of instruments  |                          |                         | Pressure |           | Temperature of the air |      |      |         |      |         |      |              |                      |                           | Precipitation | Wind                   |       |                       |                             |                         | Partly cloudy days | Cloudy days | Average cloudiness, tenths | Total snowfall | Snow, sleet and ice on ground at end of month | Number of days with thunderstorms |                      |                  |      |     |   |   |
|------------------------|---------------------------|--------------------------|-------------------------|----------|-----------|------------------------|------|------|---------|------|---------|------|--------------|----------------------|---------------------------|---------------|------------------------|-------|-----------------------|-----------------------------|-------------------------|--------------------|-------------|----------------------------|----------------|---|-----------------------------------|----------------------|------------------|------|-----|---|---|
|                        | Barometer above sea level | Thermometer above ground | Anemometer above ground | Station  | Sea level | Departure from normal  | Mean |      | Maximum | Date | Minimum | Date | Mean minimum | Greatest daily range | Mean temperature dewpoint |               | Mean relative humidity | Total | Departure from normal | Days with 0.01 inch or more | Average hourly velocity |                    |             |                            |                |   |                                   | Prevailing direction | Maximum velocity |      |     |   |   |
|                        |                           |                          |                         |          |           |                        | max. | min. |         |      |         |      |              |                      |                           |               |                        |       |                       |                             |                         |                    |             |                            |                |   |                                   |                      | Direction        | Date |     |   |   |
|                        | Ft.                       | Ft.                      | Ft.                     | In.      | In.       | In.                    | ° F. | ° F. | ° F.    | ° F. | ° F.    | ° F. | ° F.         | ° F.                 | ° F.                      | %             | In.                    | In.   | Miles                 | Miles                       |                         |                    |             | 0-10                       | In.            | In.   |                                   |                      |                  |      |     |   |   |
| New England            |                           |                          |                         |          |           |                        |      |      |         |      |         |      |              |                      |                           |               |                        |       |                       |                             |                         |                    |             |                            |                |   |                                   |                      |                  |      |     |   |   |
| Eastport               | 75                        | 67                       | 85                      | 29.83    | 29.93     | -0.05                  | 21.4 | -4.9 | 44      | 9    | 30      | -7   | 24           | 13                   | 34                        | 13            | 70                     | 1.41  | -2.3                  | 12                          | 10.4                    | W.                 | 33          | SW.                        | 21             | 10  | 8                                 | 13                   | 6.0              | 5.5  | T   | 0 |   |
| Greenville, Maine      | 1,070                     | 6                        | 41                      | 28.73    | 29.97     | -0.05                  | 21.0 | -6.6 | 40      | 9    | 32      | -25  | 16           | 2                    | 40                        | 9             | 1.05                   | -2.1  | 10                    | 10.4                        | NW.                     | 33                 | W.          | 20                         | 19             | 4   | 8                                 | 3.8                  | 3.1              | T    | 0   |   |   |
| Portland, Maine        | 103                       | 5                        | 43                      | 29.86    | 29.98     | -0.05                  | 21.0 | -6.6 | 47      | 9    | 32      | -9   | 17           | 10                   | 39                        | 11            | 72                     | 1.00  | -3.0                  | 7                           | 7.8                     | W.                 | 33          | W.                         | 20             | 19  | 4                                 | 8                    | 3.8              | 3.1  | T   | 0 |   |
| Concord                | 289                       | 4                        | 45                      | 29.68    | 30.01     | -0.05                  | 21.1 | -2.9 | 48      | 9    | 32      | -9   | 16           | 10                   | 38                        | 9             | 65                     | 0.58  | -2.6                  | 5                           | 7.4                     | W.                 | 40          | W.                         | 11             | 13  | 7                                 | 11                   | 5.1              | 1.7  | T   | 0 |   |
| Burlington             | 403                       | 6                        | 51                      | 29.54    | 30.02     | -0.03                  | 19.0 | -5.4 | 44      | 9    | 28      | -16  | 24           | 10                   | 34                        | 13            | 80                     | 0.51  | -1.4                  | 11                          | 10.7                    | S.                 | 34          | S.                         | 21             | 3   | 10                                | 18                   | 7.5              | 2.5  | 1.0 | 0 |   |
| Boston                 | 124                       | 33                       | 62                      | 29.86    | 30.01     | -0.04                  | 20.6 | -2.9 | 52      | 9    | 38      | 0    | 24           | 21                   | 30                        | 13            | 52                     | 0.99  | -2.5                  | 7                           | 12.4                    | NW.                | 44          | NW.                        | 11             | 12  | 7                                 | 12                   | 5.2              | 3.3  | 0   | 0 |   |
| Nantucket              | 12                        | 11                       | 59                      | 29.99    | 30.02     | -0.03                  | 33.1 | -2.7 | 53      | 9    | 41      | 7    | 24           | 25                   | 31                        | 25            | 74                     | 1.10  | -2.6                  | 11                          | 11.3                    | NW.                | 36          | NW.                        | 11             | 12  | 6                                 | 13                   | 5.5              | 2.6  | 0   | 0 |   |
| Block Island           | 26                        | 11                       | 46                      | 30.00    | 30.04     | -0.02                  | 32.7 | -3.3 | 53      | 9    | 40      | 6    | 24           | 25                   | 31                        | 22            | 62                     | 2.07  | -1.7                  | 7                           | 18.7                    | NW.                | 70          | NW.                        | 11             | 15  | 9                                 | 7                    | 4.2              | 3.3  | 0   | 0 |   |
| Providence             | 159                       | 46                       | 60                      | 29.85    | 30.04     | -0.02                  | 30.4 | -1.2 | 55      | 9    | 40      | 0    | 24           | 21                   | 31                        | 15            | 62                     | 1.15  | -2.2                  | 4                           | 9.2                     | NW.                | 43          | SW.                        | 21             | 14  | 7                                 | 10                   | 4.9              | 4.4  | 0   | 0 |   |
| Hartford               | 159                       | 5                        | 44                      | 29.88    | 30.07     | 0.00                   | 26.9 | -2.9 | 55      | 9    | 37      | 1    | 24           | 17                   | 27                        | 14            | 66                     | 0.91  | -3.1                  | 7                           | 8.6                     | NW.                | 38          | SW.                        | 11             | 11  | 9                                 | 11                   | 4.8              | 4.4  | 0   | 0 |   |
| New Haven              | 107                       | 5                        | 39                      | 29.94    | 30.08     | +0.01                  | 29.2 | -1.7 | 57      | 9    | 39      | 5    | 24           | 19                   | 30                        | 17            | 63                     | 1.84  | -1.9                  | 4                           | 7.4                     | NW.                | 27          | W.                         | 12             | 14  | 8                                 | 9                    | 4.5              | 4.0  | 0   | 0 |   |
| Middle Atlantic States |                           |                          |                         |          |           |                        |      |      |         |      |         |      |              |                      |                           |               |                        |       |                       |                             |                         |                    |             |                            |                |   |                                   |                      |                  |      |     |   |   |
| Albany                 | 97                        | 26                       | 40                      | 29.94    | 30.05     | -0.03                  | 23.2 | -2.3 | 45      | 9    | 32      | -8   | 24           | 14                   | 32                        | 15            | 74                     | 0.52  | -2.1                  | 7                           | 8.9                     | S.                 | 40          | W.                         | 11             | 9   | 5                                 | 17                   | 6.3              | 6.6  | T   | 0 |   |
| Binghamton             | 871                       | 60                       | 79                      | 29.10    | 30.09     | 0.00                   | 25.8 | -2.4 | 51      | 2    | 34      | -3   | 24           | 17                   | 30                        | 16            | 74                     | 0.82  | -1.4                  | 7                           | 6.2                     | W.                 | 24          | W.                         | 11             | 5   | 7                                 | 19                   | 7.3              | 3.3  | 0   | 0 |   |
| New York               | 314                       | 415                      | 454                     | 29.72    | 30.10     | +0.01                  | 32.6 | -2.4 | 50      | 9    | 40      | 9    | 24           | 25                   | 25                        | 18            | 54                     | 1.42  | -2.2                  | 4                           | 17.3                    | NW.                | 67          | NW.                        | 11             | 15  | 6                                 | 10                   | 4.6              | 1.1  | 0   | 0 |   |
| Harrisburg             | 374                       | 30                       | 49                      | 29.70    | 30.12     | 0.00                   | 32.5 | -2.2 | 59      | 9    | 41      | 10   | 16           | 24                   | 29                        | 20            | 61                     | 1.06  | -2.0                  | 2                           | 8.1                     | NW.                | 35          | NW.                        | 11             | 4   | 15                                | 12                   | 6.1              | 1.1  | 0   | 0 |   |
| Philadelphia           | 114                       | 6                        | 56                      | 29.97    | 30.11     | 0.00                   | 32.8 | -1.8 | 57      | 9    | 42      | 10   | 24           | 24                   | 28                        | 20            | 65                     | 1.23  | -2.2                  | 3                           | 10.1                    | NW.                | 37          | NW.                        | 11             | 9   | 13                                | 9                    | 5.7              | 7.7  | 0   | 0 |   |
| Reading                | 323                       | 47                       | 306                     | 29.75    | 30.13     | 0.00                   | 33.0 | -1.2 | 58      | 9    | 41      | 11   | 16           | 25                   | 25                        | 18            | 54                     | 1.27  | -2.3                  | 3                           | 11.5                    | NW.                | 50          | NW.                        | 11             | 8   | 14                                | 9                    | 5.4              | 1.1  | 0   | 0 |   |
| Scranton               | 805                       | 72                       | 104                     | 29.19    | 30.10     | 0.00                   | 27.2 | -3.5 | 53      | 9    | 36      | 4    | 16           | 19                   | 27                        | 18            | 59                     | 0.79  | -2.2                  | 7                           | 7.2                     | SW.                | 34          | NW.                        | 11             | 5   | 19                                | 7                    | 5.8              | 1.0  | 0   | 0 |   |
| Atlantic City          | 52                        | 57                       | 172                     | 30.04    | 30.11     | +0.01                  | 36.0 | -4.4 | 59      | 2    | 44      | 12   | 24           | 28                   | 26                        | 24            | 64                     | 1.89  | -2.0                  | 4                           | 14.8                    | W.                 | 42          | S.                         | 12             | 12  | 7                                 | 12                   | 5.3              | 7.7  | 0   | 0 |   |
| Trenton                | 190                       | 89                       | 107                     | 29.88    | 30.11     | +0.01                  | 32.8 | -1.6 | 57      | 9    | 41      | 11   | 16           | 24                   | 25                        | 19            | 58                     | 1.03  | -2.3                  | 3                           | 8.7                     | NW.                | 35          | NW.                        | 11             | 11  | 13                                | 7                    | 5.0              | 7.7  | 0   | 0 |   |
| Baltimore              | 123                       | 100                      | 215                     | 29.99    | 30.14     | +0.01                  | 37.3 | -1.1 | 64      | 9    | 45      | 14   | 15           | 30                   | 28                        | 22            | 59                     | 1.44  | -1.9                  | 3                           | 10.0                    | SW.                | 35          | NW.                        | 11             | 13  | 10                                | 8                    | 5.0              | 7.7  | 0   | 0 |   |
| Washington             | 112                       | 56                       | 100                     | 30.01    | 30.14     | +0.01                  | 36.4 | -2.2 | 65      | 3    | 45      | 13   | 16           | 28                   | 32                        | 20            | 55                     | 1.54  | -1.8                  | 4                           | 7.5                     | NW.                | 34          | W.                         | 11             | 13  | 10                                | 8                    | 5.2              | 7.7  | 0   | 0 |   |
| Cape Henry             | 18                        | 8                        | 54                      | 30.10    | 30.13     | +0.01                  | 42.1 | -1.6 | 72      | 3    | 49      | 22   | 18           | 35                   | 29                        | 31            | 71                     | 1.56  | -1.9                  | 7                           | 12.2                    | N.                 | 38          | NW.                        | 11             | 13  | 6                                 | 12                   | 5.1              | 1.7  | T   | 0 |   |
| Lynchburg              | 686                       | 144                      | 184                     | 29.39    | 30.15     | +0.01                  | 39.9 | -4.4 | 70      | 3    | 50      | 9    | 16           | 30                   | 32                        | 24            | 58                     | 2.93  | -3                    | 6                           | 9.2                     | W.                 | 36          | NW.                        | 20             | 11  | 9                                 | 11                   | 5.2              | 2.2  | 1.0 | 0 |   |
| Norfolk                | 91                        | 80                       | 125                     | 30.04    | 30.15     | +0.02                  | 42.8 | -3.7 | 72      | 3    | 50      | 19   | 24           | 35                   | 30                        | 31            | 73                     | 2.01  | -1.3                  | 8                           | 9.5                     | N.                 | 27          | NE.                        | 20             | 11  | 5                                 | 15                   | 5.5              | 1.1  | 0   | 0 |   |
| Richmond               | 144                       | 11                       | 52                      | 29.96    | 30.13     | -0.01                  | 39.4 | -4.4 | 74      | 3    | 49      | 12   | 30           | 29                   | 33                        | 26            | 66                     | 2.17  | -1.1                  | 7                           | 7.6                     | SW.                | 30          | SW.                        | 21             | 13  | 8                                 | 10                   | 4.9              | 4.6  | 0   | 0 |   |
| South Atlantic States  |                           |                          |                         |          |           |                        |      |      |         |      |         |      |              |                      |                           |               |                        |       |                       |                             |                         |                    |             |                            |                |   |                                   |                      |                  |      |     |   |   |
| Asheville              | 2,253                     | 77                       | 92                      | 27.75    | 30.19     | +0.03                  | 39.2 | +1.4 | 73      | 8    | 40      | 7    | 17           | 30                   | 35                        | 27            | 69                     | 1.59  | -1.6                  | 7                           | 8.5                     | NW.                | 27          | NW.                        | 11             | 8   | 7                                 | 16                   | 6.4              | 7.7  | 0   | 0 |   |
| Charlotte              | 779                       | 63                       | 86                      | 29.30    | 30.16     | 0.00                   | 43.9 | +1.9 | 72      | 9    | 43      | 15   | 16           | 35                   | 30                        | 31            | 73                     | 3.42  | -4                    | 9                           | 6.6                     | SW.                | 25          | SW.                        | 10             | 11  | 8                                 | 12                   | 5.4              | 7.7  | 0   | 0 |   |
| Greensboro             | 886                       | 6                        | 56                      | 29.18    | 30.17     | 0.00                   | 39.2 | +1.9 | 72      | 9    | 43      | 15   | 16           | 35                   | 30                        | 31            | 73                     | 3.42  | -4                    | 9                           | 6.6                     | SW.                | 25          | SW.                        | 10             | 11  | 8                                 | 12                   | 5.4              | 7.7  | 0   | 0 |   |
| Hatteras               | 11                        | 5                        | 50                      | 30.10    | 30.12     | -0.01                  | 45.7 | +1.7 | 76      | 6    | 53      | 25   | 24           | 39                   | 33                        | 40            | 83                     | 5.89  | +1.7                  | 9                           | 13.7                    | N.                 | 40          | N.                         | 29             | 13  | 5                                 | 13                   | 5.4              | 4.0  | 0   | 1 |   |
| Raleigh                | 376                       | 27                       | 69                      | 29.74    | 30.16     | +0.01                  | 41.6 | +1.1 | 70      | 9    | 52      | 12   | 16           | 32                   | 34                        | 29            | 68                     | 3.53  | 0                     | 9                           | 8.3                     | SW.                | 30          | SW.                        | 21             | 12  | 6                                 | 13                   | 5.4              | 2.0  | 0   | 0 |   |
| Wilmington             | 72                        | 73                       | 107                     | 30.07    | 30.16     | +0.01                  | 46.8 | -2.3 | 78      | 9    | 57      | 12   | 16           | 36                   | 32                        | 36            | 75                     | 3.75  | +1.0                  | 9                           | 8.3                     | N.                 | 27          | SW.                        | 26             | 17  | 5                                 | 9                    | 3.8              | 6.0  | 0   | 0 |   |
| Charleston             | 48                        | 11                       | 92                      | 30.09    | 30.15     | 0.00                   | 50.4 | -1.3 | 81      | 9    | 59      | 17   | 16           | 41                   | 26                        | 39            | 82                     | 4.47  | +1.8                  | 6                           | 9.6                     | N.                 | 26          | NE.                        | 24             | 18  | 5                                 | 8                    | 3.9              | 2.5  | 0   | 0 |   |
| Columbia, S. C.        | 349                       | 70                       | 91                      | 29.78    | 30.17     | +0.01                  | 46.8 | -4.4 | 80      | 9    | 57      | 16   | 17           | 37                   | 36                        | 35            | 76                     | 3.75  | +7                    | 8                           | 7.2                     | NE.                | 25          | NE.                        | 24             | 12  | 10                                | 9                    | 5.0              | 1.8  | 0   | 0 |   |
| Greenville, S. C.      | 1,040                     | 18                       | 36                      | 29.02    | 30.14     | +0.03                  | 43.8 | +1.6 | 76      | 9    | 53      | 15   | 17           | 35                   | 32                        | 70            | 1.89                   | -3.0  | 6                     | 8.6                         | SW.                     | 25                 | NE.         | 25                         | 11             | 8   | 12                                | 5.3                  | 7.7              | 0    | 0   |   |   |
| Augusta                | 182                       | 62                       | 77                      | 29.96    | 30.16     | 0.00                   | 48.0 | -1.1 | 78      | 10   | 59      | 17   | 17           | 37                   | 36                        | 36            | 69                     | 5.22  | +2.0                  | 7                           | 8.0                     | NW.                | 20          | W.                         | 12             | 14  | 10                                | 7                    | 4.5              | 1.3  | 0   | 1 |   |
| Savannah               | 65                        | 73                       | 152                     | 30.08    | 30.17     | +0.02                  | 52.8 | +4.4 | 82      | 9    | 63      | 20   | 16           | 42                   | 29                        | 41            | 78                     | 4.05  | +1.1                  | 7                           | 9.8                     | W.                 | 25          | NW.                        | 28             | 15  | 7                                 | 9                    | 4.5              | 1.1  | 0   | 0 |   |
| Jacksonville           | 43                        | 86                       | 110                     | 30.11    | 30.17     | +0.03                  | 57.0 | +7.7 | 81      | 9    | 66      | 26   | 17           | 48                   | 28                        | 45            | 81                     | 1.60  | -1.4                  | 5                           | 7.0                     | N.                 | 24          | NE.                        | 17             | 13  | 7                                 | 11                   | 5.1              | 1.0  | 0   | 0 |   |
| Florida Peninsula      |                           |                          |                         |          |           |                        |      |      |         |      |         |      |              |                      |                           |               |                        |       |                       |                             |                         |                    |             |                            |                |   |                                   |                      |                  |      |     |   |   |
| Key West               | 21                        | 10                       | 64                      | 30.08    | 30.11     | +0.03                  | 69.9 | -4.4 | 82      | 15   | 74      | 52   | 21           | 65                   | 18                        | 62            | 82                     | 4.49  | -1.2                  | 3                           | 9.6                     | N.                 | 24          | W.                         | 29             | 15  | 10                                | 6                    | 3.9              | 0.0  | 0   | 0 |   |
| Miami                  | 25                        | 242                      | 249                     | 30.08    | 30.12     | +0.01                  | 67.0 | -1.0 | 78      | 11   | 72      | 41   | 20           | 62                   | 24                        | 58            | 87                     | 1.85  | +2.8                  | 8                           | 12.4                    | NW.                | 32          | SE.                        | 26             | 13  | 10                                | 8                    | 4.5              | 0.0  | 0   | 0 |   |
| Tampa                  | 35                        | 6                        | 43                      | 30.11    | 30.16     | +0.04                  | 62.0 | +9.9 | 82      | 9    |         |      |              |                      |                           | 53            | 84                     | 3.36  | -1.7                  | 4                           | 8.6                     | N.                 | 27          | SW.                        | 15             | 16  | 7                                 | 8                    | 4.5              | 0.0  | 0   | 0 |   |
| East Gulf States       |                           |                          |                         |          |           |                        |      |      |         |      |         |      |              |                      |                           |               |                        |       |                       |                             |                         |                    |             |                            |                |   |                                   |                      |                  |      |     |   |   |
| Atlanta                | 1,173                     | 33                       | 72                      | 28.90    | 30.16     | 0.00                   | 44.5 | +3.3 | 73      | 8    | 52      | 16   | 16           | 36                   | 29                        | 33            | 70                     | 2.38  | -2.4                  | 7                           | 9.7                     | NW.                | 28          | NW.                        | 12             | 6   | 11                                | 14                   | 6.4              | 7.7  | 0   | 0 |   |
| Macon                  | 370                       | 49                       | 87                      | 29.76    | 30.18     | +0.02                  | 46.8 | +1.7 | 77      | 9    | 57      | 19   | 18           | 36                   | 37                        | 36            | 76                     | 3.19  | -1.8                  | 6                           | 7                       | 6.3                | NW.         | 23                         | NW.            | 10  | 10                                | 13                   | 8                | 5.1  | 7.7 | 0 | 0 |
| Thomasville            | 273                       | 49                       | 86                      | 29.88    | 30.19     | +0.04                  | 45.2 | +1.1 | 80      | 9    | 64      | 23   | 18           | 41                   | 34                        | 37            | 76                     | 3.66  | -1.6                  | 5                           | 8.0                     | N.                 | 26          | N.                         | 10             | 7   | 14                                | 11                   | 6.4              | 7.7  | 0   | 0 |   |
| Apalachicola           | 23                        | 11                       | 51                      | 30.12    | 30.16     | 0.00                   | 55.0 | -7.7 | 76      | 6    | 62      | 27   | 18           | 4                    |                           |               |                        |       |                       |                             |                         |                    |             |                            |                |   |                                   |                      |                  |      |     |   |   |

## CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

| District and station            | Elevation of instruments  |                          |                         | Pressure |           |                       | Temperature of the air |                   |         |       |         |       |              |                      |                            |                        | Precipitation | Wind  |                       |                             |                         |                      | Clear days | Partly cloudy days | Cloudy days | Average cloudiness, tenths | Total snowfall | Snow, sleet and ice on ground at end of month | Number of days with thunderstorms |                  |           |      |
|---------------------------------|---------------------------|--------------------------|-------------------------|----------|-----------|-----------------------|------------------------|-------------------|---------|-------|---------|-------|--------------|----------------------|----------------------------|------------------------|---------------|-------|-----------------------|-----------------------------|-------------------------|----------------------|------------|--------------------|-------------|----------------------------|----------------|---|-----------------------------------|------------------|-----------|------|
|                                 | Barometer above sea level | Thermometer above ground | Anemometer above ground | Station  | Sea level | Departure from normal | Mean max. min. +2      | Mean max. min. -2 | Maximum | Date  | Minimum | Date  | Mean minimum | Greatest daily range | Mean temperature dew point | Mean relative humidity |               | Total | Departure from normal | Days with 0.01 inch or more | Average hourly velocity | Prevailing direction |            |                    |             |                            |                |   |                                   | Maximum velocity |           | Date |
|                                 |                           |                          |                         |          |           |                       |                        |                   |         |       |         |       |              |                      |                            |                        |               |       |                       |                             |                         |                      |            |                    |             |                            |                |   |                                   | Miles per hour   | Direction |      |
| Ohio Valley and Tennessee       |                           |                          |                         |          |           |                       |                        |                   |         |       |         |       |              |                      |                            |                        |               |       |                       |                             |                         |                      |            |                    |             |                            |                |   |                                   |                  |           |      |
|                                 | 762                       | 6                        | 66                      | 29.35    | 30.19     | +0.03                 | 40.4                   | -1.5              | 70      | 8 51  | 11 18   | 30 39 | 32 79        | 3.00                 | -2.1                       | 7                      | 6.3           | NE.   | 28                    | NW.                         | 28                      | 10 8                 | 18 6       | 6.6                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Chattanooga <sup>1</sup>        | 995                       | 27                       | 53                      | 29.11    | 30.20     | +0.04                 | 39.8                   | -1.8              | 68      | 8 48  | 13 17   | 31 33 | 30 73        | 2.33                 | -2.2                       | 6                      | 7.5           | NE.   | 27                    | SW.                         | 27                      | 10 8                 | 17 6       | 6.6                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Knoxville <sup>1</sup>          | 309                       | 5                        | 86                      | 29.77    | 30.21     | +0.05                 | 40.7                   | -1.7              | 69      | 8 49  | 12 15   | 32 35 | 32 76        | 3.72                 | -1.8                       | 10                     | 7.4           | N.    | 21                    | SW.                         | 6                       | 7 8                  | 19 6       | 6.8                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Memphis <sup>1</sup>            | 546                       | 5                        | 72                      | 29.60    | 30.20     | +0.05                 | 38.6                   | -2.4              | 67      | 8 46  | 11 16   | 31 31 | 30 77        | 3.44                 | -1.8                       | 12                     | 7.4           | N.    | 21                    | S.                          | 6                       | 9 4                  | 18 6       | 6.5                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Nashville <sup>1</sup>          | 989                       | 6                        |                         | 29.09    | 30.21     | +0.07                 | 33.9                   | -1.9              | 64      | 5 42  | 6 16    | 26 31 | 25 72        | 1.48                 | -1.3                       | 14                     |               |       |                       |                             |                         |                      |            |                    |             |                            |                |   |                                   |                  |           |      |
| Lexington <sup>1</sup>          | 525                       | 106                      | 120                     | 29.62    | 30.20     | +0.06                 | 35.1                   | -2.5              | 61      | 5 41  | 7 16    | 29 24 | 25 72        | 1.75                 | -2.0                       | 9                      | 8.5           | N.    | 26                    | NW.                         | 12                      | 7 8                  | 16 5       | 5.9                | 4.2         | 1.5                        | 0              | 0   |                                   |                  |           |      |
| Louisville <sup>1</sup>         | 431                       | 12                       | 40                      | 29.73    | 30.21     | +0.08                 | 32.4                   | -2.4              | 63      | 5 42  | 6 16    | 24 33 | 25 78        | 1.06                 | -1.9                       | 9                      | 9.2           | N.    | 34                    | N.                          | 12                      | 10 10                | 11 5       | 5.6                | 5.0         | 2.4                        | 0              | 0   |                                   |                  |           |      |
| Evansville <sup>1</sup>         | 823                       | 5                        | 54                      | 29.26    | 30.20     | +0.08                 | 28.6                   | -2.3              | 63      | 5 38  | 1 16    | 20 35 | 21 78        | 1.05                 | -1.1                       | 7                      | 8.4           | NW.   | 33                    | W.                          | 12                      | 10 10                | 11 5       | 5.6                | 5.0         | 2.4                        | 0              | 0   |                                   |                  |           |      |
| Indianapolis <sup>1</sup>       | 573                       | 68                       | 149                     | 29.57    | 30.22     | +0.05                 | 30.6                   | -1.8              | 58      | 5 38  | 1 15    | 25 28 | 22 80        | 1.82                 | -1.1                       | 7                      | 8.4           | NW.   | 33                    | W.                          | 12                      | 10 10                | 11 5       | 5.6                | 5.0         | 2.4                        | 0              | 0   |                                   |                  |           |      |
| Terre Haute <sup>1</sup>        | 627                       | 11                       | 51                      | 29.49    | 30.20     | +0.07                 | 32.2                   | -1.2              | 63      | 5 40  | 1 15    | 25 28 | 22 77        | 1.86                 | -1.6                       | 8                      | 10.0          | W.    | 40                    | W.                          | 12                      | 10 10                | 11 5       | 5.6                | 5.0         | 2.4                        | 0              | 0   |                                   |                  |           |      |
| Cincinnati <sup>1</sup>         | 822                       | 90                       | 110                     | 29.26    | 30.17     | +0.05                 | 30.6                   | -1.8              | 58      | 5 38  | 1 15    | 25 28 | 22 77        | 1.86                 | -1.6                       | 8                      | 10.0          | W.    | 40                    | W.                          | 12                      | 10 10                | 11 5       | 5.6                | 5.0         | 2.4                        | 0              | 0   |                                   |                  |           |      |
| Columbus <sup>1</sup>           | 1,003                     | 6                        | 55                      | 29.06    | 30.18     | +0.06                 | 28.7                   | -2.6              | 57      | 5 39  | 1 15    | 25 28 | 22 77        | 1.86                 | -1.6                       | 8                      | 10.0          | W.    | 40                    | W.                          | 12                      | 10 10                | 11 5       | 5.6                | 5.0         | 2.4                        | 0              | 0   |                                   |                  |           |      |
| Dayton <sup>1</sup>             | 1,947                     | 61                       | 78                      | 28.04    | 30.18     | +0.06                 | 30.6                   | -2.1              | 59      | 5 39  | 1 15    | 25 28 | 22 77        | 1.86                 | -1.6                       | 8                      | 10.0          | W.    | 40                    | W.                          | 12                      | 10 10                | 11 5       | 5.6                | 5.0         | 2.4                        | 0              | 0   |                                   |                  |           |      |
| Elkins <sup>1</sup>             | 637                       | 77                       | 84                      | 29.47    | 30.18     | +0.04                 | 32.3                   | -2.8              | 59      | 5 40  | 1 15    | 24 24 | 24 72        | 1.68                 | -1.4                       | 9                      | 6.6           | SE.   | 25                    | NW.                         | 12                      | 11 6                 | 14 5       | 5.9                | 3.4         | 0                          | 0              | 0   |                                   |                  |           |      |
| Parkersburg <sup>1</sup>        | 842                       | 39                       | 54                      | 29.20    | 30.14     | +0.03                 | 29.4                   | -2.6              | 53      | 4 36  | 4 15    | 23 22 | 21 72        | 1.14                 | -1.7                       | 11                     | 11.3          | SW.   | 38                    | NW.                         | 10                      | 7 8                  | 16 5       | 6.8                | 1.4         | 0                          | 0              | 0   |                                   |                  |           |      |
| Pittsburgh <sup>1</sup>         |                           |                          |                         |          |           |                       | 26.0                   | -2.6              |         |       |         |       |              |                      | 76                         | 0.87                   | -1.9          |       |                       |                             |                         |                      |            |                    | 7.2         |                            |                |   |                                   |                  |           |      |
| Lower Lake Region               |                           |                          |                         |          |           |                       |                        |                   |         |       |         |       |              |                      |                            |                        |               |       |                       |                             |                         |                      |            |                    |             |                            |                |   |                                   |                  |           |      |
| Buffalo <sup>1</sup>            | 768                       | 34                       | 96                      | 29.20    | 30.07     | +0.01                 | 26.6                   | -2.2              | 46      | 2 33  | 4 15    | 20 28 | 20 75        | 0.69                 | -2.7                       | 12                     | 16.0          | SW.   | 45                    | NW.                         | 10                      | 1 13                 | 17 7       | 7.7                | 1.7         | 0                          | 0              | 0   |                                   |                  |           |      |
| Canton <sup>1</sup>             | 448                       | 10                       | 61                      | 29.51    | 30.02     | +0.01                 | 17.4                   | -5.3              | 43      | 2 26  | 25 23   | 28 40 | 13 82        | 1.30                 | -1.4                       | 11                     | 9.1           | SW.   | 30                    | NW.                         | 10                      | 7 8                  | 19 7       | 7.1                | 11.8        | 0                          | 0              | 0   |                                   |                  |           |      |
| Oswego <sup>1</sup>             | 335                       | 71                       | 85                      | 29.66    | 30.05     | +0.01                 | 25.2                   | -3.8              | 46      | 2 32  | 6 15    | 18 27 | 17 70        | 1.43                 | -2.1                       | 12                     | 11.2          | W.    | 33                    | W.                          | 10                      | 1 13                 | 17 7       | 7.1                | 11.8        | 0                          | 0              | 0   |                                   |                  |           |      |
| Rochester <sup>1</sup>          | 523                       | 5                        | 69                      | 29.48    | 30.08     | +0.02                 | 25.4                   | -2.4              | 47      | 4 33  | 7 15    | 18 27 | 17 70        | 1.43                 | -2.1                       | 12                     | 11.2          | W.    | 33                    | W.                          | 10                      | 1 13                 | 17 7       | 7.1                | 11.8        | 0                          | 0              | 0   |                                   |                  |           |      |
| Syracuse <sup>1</sup>           | 596                       | 5                        | 57                      | 29.38    | 30.07     | +0.00                 | 24.8                   | -2.6              | 47      | 2 33  | 7 15    | 18 27 | 17 70        | 1.43                 | -2.1                       | 12                     | 11.2          | W.    | 33                    | W.                          | 10                      | 1 13                 | 17 7       | 7.1                | 11.8        | 0                          | 0              | 0   |                                   |                  |           |      |
| Erie <sup>1</sup>               | 714                       | 57                       | 81                      | 29.32    | 30.13     | +0.06                 | 29.3                   | -2.6              | 50      | 4 35  | 0 15    | 24 18 | 21 78        | 1.13                 | -1.7                       | 9                      | 10.1          | SW.   | 27                    | SW.                         | 12                      | 2 9                  | 11 18      | 7.6                | 7.8         | 0                          | 0              | 0   |                                   |                  |           |      |
| Cleveland <sup>1</sup>          | 762                       | 27                       | 54                      | 29.28    | 30.14     | +0.05                 | 28.4                   | -1.7              | 54      | 4 35  | 4 21    | 21 30 | 20 74        | 1.02                 | -1.4                       | 11                     | 12.0          | SW.   | 32                    | SW.                         | 10                      | 8 6                  | 17 6       | 6.8                | 6.9         | 0                          | 0              | 0   |                                   |                  |           |      |
| Sandusky <sup>1</sup>           | 629                       | 5                        | 67                      | 29.43    | 30.15     | +0.06                 | 28.8                   | -2.4              | 54      | 4 36  | 3 15    | 22 27 | 20 76        | 1.61                 | -1.7                       | 7                      | 12.1          | SW.   | 32                    | NW.                         | 10                      | 6 12                 | 13 6       | 6.4                | 1.1         | 0                          | 0              | 0   |                                   |                  |           |      |
| Toledo <sup>1</sup>             | 628                       | 5                        | 47                      | 29.43    | 30.16     | +0.08                 | 26.2                   | -2.9              | 50      | 4 35  | 1 15    | 17 30 | 19 76        | 1.61                 | -1.7                       | 7                      | 12.1          | SW.   | 32                    | NW.                         | 10                      | 8 6                  | 17 6       | 6.8                | 6.9         | 0                          | 0              | 0   |                                   |                  |           |      |
| Fort Wayne <sup>1</sup>         | 857                       | 5                        | 33                      | 29.18    | 30.15     | +0.05                 | 26.4                   | -2.2              | 53      | 5 35  | 4 15    | 18 30 | 19 77        | 1.34                 | -2.2                       | 4                      | 9.2           | W.    | 30                    | NW.                         | 12                      | 7 13                 | 11 6       | 6.1                | 1.2         | 0                          | 0              | 0   |                                   |                  |           |      |
| Detroit <sup>1</sup>            | 730                       | 5                        | 78                      | 29.30    | 30.12     | +0.05                 | 27.4                   | -1.5              | 50      | 4 34  | 20 28   | 20 72 | 20 72        | 1.43                 | -1.9                       | 6                      | 11.3          | SW.   | 34                    | NW.                         | 10                      | 5 11                 | 15 6       | 6.8                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Upper Lake Region               |                           |                          |                         |          |           |                       |                        |                   |         |       |         |       |              |                      |                            |                        |               |       |                       |                             |                         |                      |            |                    |             |                            |                |   |                                   |                  |           |      |
| Alpena <sup>1</sup>             | 609                       | 5                        | 89                      | 29.33    | 30.03     | +0.01                 | 24.3                   | -1.5              | 44      | 4 32  | 0 13    | 17 30 | 18 79        | 1.83                 | -1.2                       | 12                     | 11.4          | SW.   | 35                    | NW.                         | 20                      | 1 8                  | 13 10      | 5.0                | 7.2         | 0                          | 0              | 0   |                                   |                  |           |      |
| Escanaba <sup>1</sup>           | 612                       | 51                       | 72                      | 29.35    | 30.05     | +0.02                 | 23.0                   | -1.6              | 44      | 4 31  | 3 14    | 15 36 | 14 72        | 1.18                 | -1.6                       | 4                      | 11.6          | SW.   | 36                    | NW.                         | 19                      | 8 13                 | 10 5       | 5.8                | 1.8         | 0                          | 0              | 0   |                                   |                  |           |      |
| Grand Rapids <sup>1</sup>       | 707                       | 70                       | 244                     | 29.32    | 30.11     | +0.06                 | 27.8                   | -1.7              | 49      | 1 34  | 6 14    | 21 24 | 20 81        | 3.4                  | -2.2                       | 3                      | 12.4          | SW.   | 43                    | SW.                         | 11                      | 5 7                  | 19 6       | 6.9                | 1.5         | 0                          | 0              | 0   |                                   |                  |           |      |
| Lansing <sup>1</sup>            | 878                       | 5                        | 90                      | 29.13    | 30.12     | +0.02                 | 25.4                   | -1.4              | 48      | 1 32  | 3 15    | 18 26 | 19 79        | 1.45                 | -1.6                       | 5                      | 9.4           | SW.   | 26                    | SW.                         | 11                      | 6 8                  | 17 6       | 6.8                | 1.9         | 0                          | 0              | 0   |                                   |                  |           |      |
| Marquette <sup>1</sup>          | 734                       | 44                       | 73                      | 29.18    | 30.02     | +0.00                 | 23.5                   | -1.9              | 42      | 26 31 | 2 14    | 16 35 | 15 73        | 0.69                 | -2.0                       | 10                     | 10.0          | W.    | 35                    | SW.                         | 11                      | 4 7                  | 20 7       | 6.6                | 6.9         | 0                          | 0              | 0   |                                   |                  |           |      |
| Sault Sainte Marie <sup>1</sup> | 614                       | 11                       | 52                      | 29.30    | 30.00     | +0.00                 | 18.7                   | -1.1              | 39      | 4 28  | 18 14   | 10 40 | 13 80        | 1.54                 | -1.7                       | 7                      | 12.5          | E.    | 46                    | NW.                         | 10                      | 2 6                  | 23 8       | 3.3                | 16.4        | 4.4                        | 0              | 0   |                                   |                  |           |      |
| Chicago <sup>1</sup>            | 673                       | 5                        | 36                      | 29.40    | 30.16     | +0.08                 | 27.6                   | -1.7              | 56      | 5 35  | 3 23    | 20 28 | 18 71        | 1.34                 | -1.7                       | 2                      | 10.4          | SW.   | 27                    | NW.                         | 19                      | 11 10                | 10 5       | 5.3                | 1           | 0                          | 0              | 0   |                                   |                  |           |      |
| Green Bay <sup>1</sup>          | 617                       | 109                      | 141                     | 29.39    | 30.09     | +0.05                 | 23.6                   | -1.3              | 47      | 4 32  | 6 15    | 15 35 | 14 66        | 0.00                 | -1.7                       | 1                      | 12.0          | SW.   | 34                    | NW.                         | 19                      | 13 10                | 8 4        | 4.9                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Milwaukee <sup>1</sup>          | 681                       | 33                       | 66                      | 29.36    | 30.13     | +0.07                 | 25.1                   | -1.4              | 43      | 4 34  | 5 23    | 16 29 | 16 86        | 0.99                 | -1.7                       | 4                      | 13.8          | SW.   | 42                    | SW.                         | 11                      | 11 8                 | 12 5       | 5.3                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Duluth <sup>1</sup>             | 1,133                     | 5                        | 47                      | 28.78    | 30.07     | +0.02                 | 18.0                   | -2.1              | 40      | 11 27 | 19 14   | 9 38  | 10 82        | 1.3                  | -1.0                       | 2                      | 14.5          | W.    | 50                    | NW.                         | 22                      | 9 14                 | 6 5        | 5.2                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| North Dakota                    |                           |                          |                         |          |           |                       |                        |                   |         |       |         |       |              |                      |                            |                        |               |       |                       |                             |                         |                      |            |                    |             |                            |                |   |                                   |                  |           |      |
| Fargo <sup>1</sup>              | 940                       | 5                        | 43                      | 29.04    | 30.11     | +0.03                 | 19.8                   | +8.3              | 49      | 18 31 | -11 14  | 9 34  | 12 72        | 1.10                 | -6                         | 3                      | 12.9          | S.    | 41                    | NW.                         | 19                      | 11 10                | 10 5       | 5.0                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Bismarck <sup>1</sup>           | 1,677                     | 5                        | 43                      | 28.26    | 30.12     | +0.04                 | 22.7                   | +9.9              | 54      | 3 34  | -13 14  | 11 33 | 17 80        | 1.33                 | -2                         | 4                      | 9.8           | NW.   | 32                    | W.                          | 11                      | 13 6                 | 12 5       | 5.0                | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Devils Lake <sup>1</sup>        | 1,478                     | 11                       | 44                      | 28.43    | 30.09     | +0.03                 | 18.9                   | +9.4              | 46      | 18 30 | -9 14   | 7 45  | 13 80        | 1.16                 | -4                         | 3                      | 9.4           | NW.   | 29                    | NW.                         | 18                      | 11 9                 | 11 5       | 5.6                | 1.4         | 0                          | 0              | 0   |                                   |                  |           |      |
| Lemmon, S. Dak. <sup>1</sup>    | 2,602                     | 4                        | 38                      |          |           |                       | 17.4                   |                   | 44      | 18 28 | -14 14  | 6 32  | 12           | 1.22                 |                            | 4                      |               | NW.   |                       |                             | 13                      | 11 7                 | 7          | 7                  | 2.3         | 0                          | 0              | 0   |                                   |                  |           |      |
| Grand Forks <sup>1</sup>        | 832                       | 4                        | 41                      | 29.14    | 30.09     | +0.03                 | 23.2                   | +9.4              | 55      | 3 34  | -14 14  | 13 34 | 16 76        | 1.13                 | -4                         | 4                      | 6.6           | SW.   | 25                    | NW.                         | 8 8                     | 15 5                 | 5.4        | 0                  | 0           | 0                          | 0              | 0   |                                   |                  |           |      |
| Williston <sup>1</sup>          | 1,878                     | 42                       | 50                      | 28.04    | 30.09     | +0.03                 | 23.2                   | +9.4              | 55      | 3 34  | -14 14  | 13 34 | 16 76        | 1.13                 | -4                         | 4                      | 6.6           | SW.   | 25                    | NW.                         | 8 8                     | 15 5                 | 5.4        | 0                  | td          |                            |                |   |                                   |                  |           |      |

## CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

| District and station | Elevation of instruments  |                          |                         | Pressure |           |                       | Temperature of the air |              |      |         |      |              |         |      |              |                      | Precipitation | Wind  |                       |                             |                         |                      | Clear days | Partly cloudy days | Cloudy days | Average cloudiness, tenths | Total snowfall | Snow, sleet and ice on ground at end of month |                        | Number of days with thunderstorms             |                                   |           |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
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|                      | Barometer above sea level | Thermometer above ground | Anemometer above ground | Station  | Sea level | Departure from normal | Temperature of the air |              |      |         |      |              |         |      |              |                      |               | Total | Departure from normal | Days with 0.01 inch or more | Average hourly velocity | Prevailing direction |            |                    |             |                            |                | Maximum velocity                              |                        |   |                                   |           |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|                      |                           |                          |                         |          |           |                       | Mean max. +2           | Mean min. -2 | Mean | Maximum | Date | Mean maximum | Minimum | Date | Mean minimum | Greatest daily range |               |       |                       |                             |                         |                      |            |                    |             |                            |                | Mean  | Mean relative humidity |   | Miles per hour                    | Direction | Date |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|                      | Ft.                       | Ft.                      | Ft.                     | In.      | In.       | In.                   | °F.                    | °F.          | °F.  | °F.     | °F.  | °F.          | °F.     | °F.  | °F.          | %                    | In.           | In.   | Miles                 | Miles                       |                         | Miles per hour       | Direction  | Date               | Clear days  | Partly cloudy days         | Cloudy days    | Average cloudiness, tenths                    | Total snowfall         | Snow, sleet and ice on ground at end of month | Number of days with thunderstorms |           |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
| Northern Slope       |                           |                          |                         |          |           |                       |                        |              |      |         |      |              |         |      |              |                      |               |       |                       |                             |                         |                      |            |                    |             |                            |                |   |                        |   |                                   |           |      | 27.4 | +3.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |

## CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

| District and station | Elevation of instruments  |                          |                         | Pressure |           |                       | Temperature of the air |                       |           |      |              |              |      |                |           |              | Precipitation of the<br>mean temperature of the<br>dewpoint | Precipitation        |       |                       | Wind                        |                         |                      |                  |    |            |                    |             |                            |                |   |                                   |  |  |
|----------------------|---------------------------|--------------------------|-------------------------|----------|-----------|-----------------------|------------------------|-----------------------|-----------|------|--------------|--------------|------|----------------|-----------|--------------|---|----------------------|-------|-----------------------|-----------------------------|-------------------------|----------------------|------------------|----|------------|--------------------|-------------|----------------------------|----------------|---|-----------------------------------|--|--|
|                      | Barometer above sea level | Thermometer above ground | Anemometer above ground | Station  | Sea level | Departure from normal | Mean max. + min. +2    | Departure from normal |           |      |              | Mean maximum |      |                |           | Mean minimum |   | Greatest daily range | Total | Departure from normal | Days with 0.01 inch or more | Average hourly velocity | Prevailing direction | Maximum velocity |    | Clear days | Partly cloudy days | Cloudy days | Average cloudiness, tenths | Total snowfall | Snow, sleet and ice on ground at end of month | Number of days with thunderstorms |  |  |
|                      |                           |                          |                         |          |           |                       |                        | Mean max.             | Mean min. | Date | Mean maximum | Minimum      | Date | Miles per hour | Direction |              |   |                      |       |                       |                             |                         |                      | Date             |    |            |                    |             |                            |                |   |                                   |  |  |
| Panama Canal         | ft.                       | ft.                      | ft.                     | in.      | in.       | in.                   | ° F.                   | ° F.                  | ° F.      | ° F. | ° F.         | ° F.         | ° F. | ° F.           | ° F.      | ° F.         | in.   | in.                  |       | Miles                 |                             |                         |                      |                  |    |            |                    |             |                            |                |   |                                   |  |  |
| Balboa Heights       | 118                       | 6                        | 92                      |          | 29.84     | +0.02                 | 79.4                   | -6                    | 92        | 9    | 87           | 69           | 31   | 72             | 20        | 72           | 84  | 8.53                 | +3.7  | 19                    | 6.0                         | NW.                     | 23                   | NW.              | 21 | 1          | 23                 | 7           | 6.5                        | .0             | .0  | 1                                 |  |  |
| Cristobal            | 27                        | 47                       | 97                      |          | 29.86     | +0.02                 | 80.0                   | +1                    | 87        | 9    | 84           | 72           | 20   | 76             | 12        | 73           | 80  | 15.04                | +3.4  | 18                    | 11.4                        | NE.                     | 35                   | NW.              | 19 | 7          | 11                 | 13          | 6.5                        | .0             | .0  | 2                                 |  |  |
| Alaska               |                           |                          |                         |          |           |                       |                        |                       |           |      |              |              |      |                |           |              |   |                      |       |                       |                             |                         |                      |                  |    |            |                    |             |                            |                |   |                                   |  |  |
| Anchorage            | 132                       | 5                        | 22                      |          |           |                       |                        |                       |           |      |              |              |      |                |           |              |   |                      |       |                       |                             |                         |                      |                  |    |            |                    |             |                            |                |   |                                   |  |  |
| Fairbanks            | 455                       | 4                        | 63                      |          | 29.04     |                       | -1.2                   | +5.9                  | 42        | 13   | 9            | -40          | 18   | -12            |           | -3           | 80  | .87                  | +3    | 10                    | 4.6                         | N.                      | 17                   | W.               | 10 | 5          | 4                  | 22          | 13.0                       | 9.6            | 0   |                                   |  |  |
| Juneau               | 80                        | 6                        | 21                      |          | 29.77     |                       | 37.0                   |                       | 47        | 14   | 40           | 37           | 1    | 34             |           | 35           | 90  | 9.86                 |       | 30                    | 12.7                        | E.                      | 45                   | E.               | 9  | 0          | 2                  | 29          | 13.4                       | 1.3            | 0   |                                   |  |  |
| Nome                 | 22                        | 25                       | 56                      |          | 29.56     |                       | 5.8                    | -1.7                  | 32        | 31   | 12           | -19          | 12   | 0              |           | 80           | .70   |                      | -4    | 13                    | 8.3                         | NE.                     | 31                   | NE.              | 25 | 10         | 4                  | 17          | 12.2                       | 13.0           | 0   |                                   |  |  |
| Hawaiian Islands     |                           |                          |                         |          |           |                       |                        |                       |           |      |              |              |      |                |           |              |   |                      |       |                       |                             |                         |                      |                  |    |            |                    |             |                            |                |   |                                   |  |  |
| Honolulu             | 38                        | 86                       | 100                     | 30.00    | 30.01     |                       | 74.2                   | +1.8                  | 81        | 7    | 79           | 65           | 12   | 70             | 14        |              | 1.65  | -2.3                 | 12    | 8.9                   | NE.                         | 30                      | E.                   | 27               | 10 | 15         | 6                  | 4.9         | .0                         | .0             | 2   |                                   |  |  |

## Late Reports for November 1943

|           |       |    |    |       |       |       |      |      |    |    |       |    |    |    |    |    |     |      |       |     |     |     |     |    |    |    |     |     |     |     |    |   |
|-----------|-------|----|----|-------|-------|-------|------|------|----|----|-------|----|----|----|----|----|-----|------|-------|-----|-----|-----|-----|----|----|----|-----|-----|-----|-----|----|---|
| Alaska    |       |    |    |       |       |       |      |      |    |    |       |    |    |    |    |    |     |      |       |     |     |     |     |    |    |    |     |     |     |     |    |   |
| Fairbanks | 455   | 4  | 63 | 29.10 | 29.63 | ----- | 12.0 | +8.6 | 46 | 25 | 23-24 | 1  | 1  | 42 | 10 | 80 | .11 | -6   | 3     | 5.5 | N.  | 26  | SE. | 25 | 8  | 5  | 17  | 6.4 | 1.3 | 2.2 | 0  |   |
| Ketchikan | 75    | 09 | 90 | 29.85 | 29.87 | ----- | 45.0 | +4.9 | 57 | 25 | 50    | 30 | 30 | 40 | 20 | 40 | 84  | 24.5 | 6+4.4 | 24  | 9.6 | SE. | 34  | S. | 21 | 0  | 2   | 28  | 9.6 | .0  | .0 | 1 |
| Kotzebue  | 20    | 5  | 31 | 29.59 | 29.60 | ----- | 14.0 | +8.1 | 36 | 27 | 21-9  | 11 | 7  | 21 | 11 | 84 | .42 | +3   | 8     |     | E.  |     |     | 7  | 8  | 15 | 6.0 | 6.0 | 4.3 | 0   |    |   |
| McGrath   | 331   | 5  | 31 | 29.13 | 29.52 | ----- | 12.8 |      | 46 | 25 | 20-13 | 6  | 5  | 28 | 11 | 85 | .55 | -3   | 12    |     | NE. | 30  | S.  | 25 | 6  | 9  | 16  | 7.3 | 7.9 | 2.8 | 0  |   |
| Northway  | 1,718 | 5  | 32 | 27.53 |       | ----- | 4.0  |      | 34 | 20 | 13-23 | 7  | -5 | 34 | 4  | 94 | .59 |      | 7     |     | NW. |     |     | 2  | 13 | 15 | 7.1 | 6.4 | 7.0 | 0   |    |   |

1 Data are airport records.

2 Barometric data (adjusted to old city elevation) and hygrometric data from airport; otherwise city office records.

3 Observations taken bihourly.

4 Pressure (adjusted to old city elevation) temperature and hygrometric data from airport; otherwise city office records.

5 Temperature and precipitation from city office records, other data from airport.

NOTE.—Except as indicated by notes 1, 2, 4, and 5 data in table are city office records.

## SEVERE LOCAL STORMS, DECEMBER 1943

(Compiled by Mary O. Souder)

[The table herewith contains such data as has been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the United States Meteorological Yearbook]

| Place   | Date      | Time  | Width of path, yards | Loss of life | Value of property destroyed | Character of storm  | Remarks  |
|---|-----------|---|----------------------|--------------|-----------------------------|---------------------|--|
| Santa Barbara to Eureka, Calif.   | Dec. 5-10 |   |                      |              | \$750,000                   | Wind.....           | California's worst windstorm in years diminished in fury after battering ships, unroofing houses, disrupting communications, and toppling trees. Damage ran into millions of dollars. Although no lives were lost, many were homeless and some injured. The winds came out of apparently crystal-clear California skies on the night of the 8th, wrecking fishing boats at Monterey, alone valued at \$750,000. Two liberty freighters were damaged at their San Francisco wharves and a 100-foot tugboat sank, her side caved in. A trawler was beached. From Oregon into southern California, trees, oil derricks, and power lines were down, roofs damaged, traffic congested, and trains delayed. Winds recorded at from 50 to 74 miles an hour whipped the coast. |
| Lake Michigan, Mich.  | 11        |   |                      | 8            |                             | do.....             | Three lives were lost in the sinking of two small ships.   |
| Oswego and Oneida Counties, N. Y., portions of Shreveport, La., and vicinity. | 22        |   |                      |              | 95,000                      | Snow.....           | A moderately heavy snowfall stalled motor traffic and delayed trains.  |
| Arkansas.....   | 24        | 2:25 a. m.-2:15 p. m., central standard time. |                      |              |                             | Glaze.....          | Area of greatest damage was centered over Shreveport extending northward to about the Arkansas line, westward to just over the Texas line, about 60 miles southward, and eastward about 35 miles. Greatest loss in public utilities.   |
| New York State (northern sections).   | 24-25     |   |                      |              |                             | Rain and glaze..... | Freezing rain coated highways with a layer of ice. Power and communication lines were broken, highway traffic greatly impeded, and several persons injured by falling or in traffic accidents.   |
| Cincinnati, Ohio.....   | 26        |   |                      | 2            |                             | Glaze.....          | Motoring extremely hazardous. Several regularly scheduled bus runs canceled and two persons were killed and two injured in a highway accident near Ogdensburg.   |
|   | 28-29     |   |                      |              |                             | Snow.....           | Six inches of snow recorded at the Clifton Observatory, the heaviest amount since December 27, 1939, when 6.1 inches were measured. However, only 4 inches fell at Lunken Airport and communities surrounding the city reported less than 6 inches. There were 35 motor accidents with 5 persons injured and 7 others injured from falls. In the county all the available equipment was used to clear the highways. 61 trucks along with a number of plows, sanders, and graders spread sand and cinders. Highways in the western portions of the county were in worse condition than those in other sections.   |

## SOLAR RADIATION AND SUNSPOT DATA FOR DECEMBER 1943

[Solar Radiation Investigations Section, I. F. HAND in charge]

## SOLAR RADIATION OBSERVATIONS

Explanations of the tables and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the January 1942 REVIEW, page 20; a list of pyrheliometric stations is also given in the REVIEW for January 1943, page 12.

TABLE 1.—Solar radiation intensities during December 1943

[Gram-calories per minute per square centimeter of normal surface]

| Madison, Wis. |                       |          |       |       |       |      |       |       |       |       |            |                       |  |
|---------------|-----------------------|----------|-------|-------|-------|------|-------|-------|-------|-------|------------|-----------------------|--|
| Date          | Sun's zenith distance |          |       |       |       |      |       |       |       |       |            | Local mean solar time |  |
|               | 7:30 a. m.            | 78.7°    | 75.7° | 70.7° | 60.0° | 0.0° | 60.0° | 70.7° | 75.7° | 78.7° | 1:30 p. m. |                       |  |
|               | 75th mer. time        | Air mass |       |       |       |      |       |       |       |       |            |                       |  |
|               |                       | A. M.    |       |       |       |      | P. M. |       |       |       |            |                       |  |
|               |                       | e.       | 5.0   | 4.0   | 3.0   | 2.0  | *1.0  | 2.0   | 3.0   | 4.0   | 5.0        |                       |  |
| Dec. 4.....   | mb.                   | cal.     | cal.  | cal.  | cal.  | cal. | cal.  | cal.  | cal.  | cal.  | mb.        |                       |  |
| 10.....       | 5.3                   | 0.77     | 0.94  | 1.13  | 1.60  | 1.45 | 1.45  | 1.02  | 1.08  | 1.18  | 6.4        |                       |  |
| 11.....       | 4.0                   | .96      | 1.08  | 1.19  | 1.45  | 1.45 | 1.45  | 1.02  | 1.08  | 1.18  | 4.2        |                       |  |
| 16.....       | 1.9                   | .90      | 1.02  | 1.11  | 1.42  | 1.45 | 1.45  | 1.02  | 1.08  | 1.18  | 3.0        |                       |  |
| 17.....       | 1.1                   | .58      | .77   | 1.10  | 1.65  | 1.45 | 1.45  | 1.08  | 1.08  | 1.18  | 1.4        |                       |  |
| 18.....       | 1.7                   | .69      | .79   | .98   | 1.48  | 1.45 | 1.45  | 1.13  | 1.08  | 1.18  | 2.9        |                       |  |
| 19.....       | 3.5                   | .84      | .98   | 1.11  | 1.46  | 1.45 | 1.45  | 1.13  | 1.08  | 1.18  | 4.4        |                       |  |
| 20.....       | 1.9                   | .84      | .94   | 1.14  | 1.50  | 1.45 | 1.45  | 1.08  | 1.08  | 1.18  | 2.5        |                       |  |
| 21.....       | 3.1                   | .95      | 1.08  | 1.19  | 1.45  | 1.45 | 1.45  | 1.08  | 1.08  | 1.18  | 1.3        |                       |  |
| 22.....       | 0.9                   | .95      | 1.06  | 1.16  | 1.54  | 1.45 | 1.45  | 1.15  | 1.08  | 1.18  | 0.5        |                       |  |

TABLE 1.—Solar radiation intensities during December 1943—Con.

[Gram-calories per minute per square centimeter of normal surface]

| Madison, Wis.—Continued |                       |          |       |       |       |      |       |       |       |       |               |     |
|-------------------------|-----------------------|----------|-------|-------|-------|------|-------|-------|-------|-------|---------------|-----|
| Date                    | Sun's zenith distance |          |       |       |       |      |       |       |       |       | 1:30<br>p. m. |     |
|                         | 7:30<br>a. m.         | 78.7°    | 75.7° | 70.7° | 60.0° | 0.0° | 60.0° | 70.7° | 75.7° | 78.7° |               |     |
|                         | 75th<br>mer.<br>time  | Air mass |       |       |       |      |       |       |       |       |               |     |
|                         |                       | A. M.    |       |       |       |      | P. M. |       |       |       |               |     |
|                         |                       | e.       | 5.0   | 4.0   | 3.0   | 2.0  | *1.0  | 2.0   | 3.0   | 4.0   |               | 5.0 |
| 23.....                 | mb.                   | cal.     | cal.  | cal.  | cal.  | cal. | cal.  | cal.  | cal.  | cal.  | mb.           |     |
| 31.....                 | 0.7                   | .79      | .91   | 1.24  | 1.62  | 1.62 | 1.18  | .91   | 1.18  | 1.0   | 1.0           |     |
| Means.....              | 2.9                   | .66      | .71   | .79   | 1.28  | 1.28 | 1.08  | .91   | 1.18  | 3.8   | 3.8           |     |
| Departures.....         |                       | .81      | .93   | 1.10  | 1.50  | 1.50 | 1.08  | .91   | 1.18  |       |               |     |
|                         |                       | -.13     | -.14  | -.11  | -.04  | -.04 | -.12  | -.12  | -.12  |       |               |     |

| Albuquerque, N. Mex. |      |        |        |        |        |        |        |      |      |      |     |  |
|----------------------|------|--------|--------|--------|--------|--------|--------|------|------|------|-----|--|
| Dec. 3.....          | 3.7  | 0.99   | 1.19   | 1.30   | 1.41   | 1.41   | 1.41   | 1.06 | 0.91 | 0.81 | 3.7 |  |
| 4.....               | 3.7  | 1.07   | 1.19   | 1.30   | 1.41   | 1.41   | 1.41   | 1.06 | 0.91 | 0.81 | 4.1 |  |
| 5.....               | 6.1  | 1.07   | 1.19   | 1.30   | 1.41   | 1.41   | 1.41   | 1.06 | 0.91 | 0.81 | 8.8 |  |
| 10.....              | 3.7  | 1.07   | 1.19   | 1.30   | 1.41   | 1.41   | 1.41   | 1.06 | 0.91 | 0.81 | 5.1 |  |
| 16.....              | 3.0  | .99    | 1.18   | 1.28   | 1.38   | 1.38   | 1.38   | 1.41 | 1.29 | 1.08 | 4.7 |  |
| 17.....              | 3.0  | 1.08   | 1.18   | 1.28   | 1.38   | 1.38   | 1.38   | 1.46 | 1.29 | 1.08 | 5.1 |  |
| 20.....              | 4.1  | 1.08   | 1.18   | 1.28   | 1.38   | 1.38   | 1.38   | 1.46 | 1.29 | 1.08 | 4.7 |  |
| 30.....              | 2.4  | 1.08   | 1.18   | 1.28   | 1.38   | 1.38   | 1.38   | 1.46 | 1.29 | 1.08 | 4.1 |  |
| Means.....           | 1.03 | (1.18) | (1.29) | (1.38) | (1.44) | (1.44) | (1.44) | 1.15 | 1.00 | .86  |     |  |
| Departures.....      | -.04 | .00    | -.01   | -.05   | .00    | .00    | .00    | -.11 | -.12 | -.16 |     |  |

\*Extrapolated.

\*Extrapolated.

TABLE 2.—Daily totals and weekly means of solar radiation (direct+diffuse) received on a horizontal surface

[Gram-calories per square centimeter]

| Date 1943        | Washington, D. C. | Madison, Wis. | Lincoln, Nebr. | East Lansing, Mich. | New York, N. Y. | Nashville, Tenn. | Twin Falls, Idaho | New Orleans, La. | La Jolla, Calif. | Riverside, Calif. | Blue Hill, Mass. | Ithaca, N. Y. | Newport, R. I. | State College, Pa. | Put in Bay, Ohio | Fresno, Calif. | East Wareham, Mass. | Davis, Calif. |
|------------------|-------------------|---------------|----------------|---------------------|-----------------|------------------|-------------------|------------------|------------------|-------------------|------------------|---------------|----------------|--------------------|------------------|----------------|---------------------|---------------|
| December 3.....  | cal.              | cal.          | cal.           | cal.                | cal.            | cal.             | cal.              | cal.             | cal.             | cal.              | cal.             | cal.          | cal.           | cal.               | cal.             | cal.           | cal.                | cal.          |
| 4.....           | 130               | 197           | 256            | 59                  | 39              | 40               | 163               | 179              | 239              | 280               | 41               | 27            | 54             | 14                 | 195              | 243            | 73                  | 223           |
| 5.....           | 116               | 209           | 242            | 146                 | 122             | 205              | 138               | 210              | 297              | 267               | 171              | 84            | 197            | 147                | 174              | 251            | 216                 | 194           |
| 6.....           | 156               | 146           | 94             | 103                 | 228             | 199              | 115               | 120              | 132              | 207               | 226              | 59            | 230            | 228                | 195              | 206            | 232                 | 138           |
| 7.....           | 60                | 100           | 223            | 13                  | 84              | 138              | 200               | 248              | 80               | 206               | 121              | 26            | 138            | 75                 | 12               | 280            | 114                 | 204           |
| 8.....           | 225               | 102           | 270            | 81                  | 194             | 46               | 129               | 152              | 197              | 259               | 105              | 62            | 58             | 106                | 66               | 259            | 77                  | 241           |
| 9.....           | 116               | 160           | 238            | 24                  | 41              | 33               | 106               | 272              | 287              | 273               | 188              | 43            | 164            | 31                 | 23               | 266            | 186                 | 267           |
| 10.....          | 134               | 87            | 271            | 83                  | 130             | 15               | 217               | 207              | 114              | 232               | 116              | 133           | 141            | 176                | 56               | 216            | 126                 | 266           |
| Mean.....        | 134               | 143           | 228            | 73                  | 120             | 96               | 153               | 198              | 192              | 246               | 138              | 62            | 140            | 111                | 163              | 243            | 146                 | 219           |
| Departure.....   | -27               | +26           | +53            | -----               | -6              | -22              | +29               | -8               | -50              | +33               | 60               | -34           | 0              | -7                 | -16              | +54            | -1                  | +27           |
| December 10..... | 31                | 189           | 257            | 76                  | 93              | 6                | 230               | 248              | 44               | 39                | 139              | 102           | 138            | 73                 | 173              | 126            | 146                 | 238           |
| 11.....          | 248               | 200           | 253            | 164                 | 241             | 231              | 194               | 329              | 103              | 86                | 236              | 121           | 240            | 198                | 222              | 115            | 244                 | 249           |
| 12.....          | 232               | 88            | 38             | 29                  | 69              | 238              | 169               | 426              | 268              | 154               | 87               | 22            | 135            | 88                 | 107              | 244            | 115                 | 216           |
| 13.....          | 253               | 84            | 117            | 104                 | 228             | 185              | 192               | 282              | 209              | 216               | 173              | 41            | 134            | 90                 | 240              | 218            | 221                 | 221           |
| 14.....          | 156               | 235           | 262            | 155                 | 82              | 124              | 191               | 33               | 283              | 272               | 90               | 74            | 58             | 127                | 193              | 243            | 72                  | 210           |
| 15.....          | 164               | 182           | 234            | 102                 | 210             | 221              | 184               | 154              | 230              | 278               | 214              | 190           | 194            | 240                | 194              | 248            | 210                 | 218           |
| 16.....          | 217               | 178           | 196            | 120                 | 201             | 227              | 215               | 400              | 223              | 264               | 214              | 133           | 207            | 146                | 152              | 184            | 173                 | 121           |
| Mean.....        | 186               | 165           | 194            | 107                 | 160             | 176              | 196               | 268              | 202              | 186               | 171              | 116           | 145            | 144                | 162              | 200            | 168                 | 213           |
| Departure.....   | +46               | -59           | +34            | -----               | +44             | +37              | +72               | +72              | -38              | -11               | +36              | -5            | -1             | +26                | +33              | +30            | +13                 | +51           |
| December 17..... | 257               | 179           | 222            | 157                 | 102             | 210              | 173               | 338              | 52               | 80                | 201              | 89            | 208            | 149                | 213              | 119            | 212                 | 133           |
| 18.....          | 271               | 190           | 178            | 22                  | 116             | 221              | 139               | 367              | 131              | 100               | 181              | 53            | 169            | 140                | 63               | 96             | 184                 | 81            |
| 19.....          | 213               | 194           | 211            | 131                 | 125             | 218              | 39                | 362              | 130              | 176               | 164              | 106           | 158            | 161                | 176              | 173            | 169                 | 36            |
| 20.....          | 241               | 190           | 169            | 168                 | 197             | 200              | 97                | 320              | 108              | 178               | 154              | 128           | 155            | 110                | 213              | 50             | 142                 | 84            |
| 21.....          | 123               | 138           | 235            | 49                  | 160             | 197              | 50                | 160              | 232              | 142               | 144              | 87            | 149            | 184                | 102              | 78             | 179                 | 225           |
| 22.....          | 152               | 206           | 118            | 104                 | 120             | 224              | 30                | 186              | 232              | 225               | 142              | 83            | 175            | 129                | 141              | 215            | 148                 | 36            |
| 23.....          | 202               | 198           | 232            | 115                 | 188             | 199              | 156               | 130              | 260              | 249               | 219              | 193           | 200            | 156                | 129              | 96             | 212                 | 144           |
| Mean.....        | 208               | 185           | 195            | 107                 | 144             | 210              | 98                | 266              | 166              | 155               | 172              | 106           | 174            | 147                | 148              | 118            | 178                 | 196           |
| Departure.....   | +60               | +66           | +24            | -----               | +32             | +70              | -14               | +59              | -72              | -64               | +35              | +12           | +31            | +37                | +34              | -33            | +19                 | -12           |
| December 24..... | 253               | 59            | 117            | 134                 | 200             | 65               | 69                | 57               | 242              | 251               | 233              | 160           | 227            | 181                | 152              | 58             | 238                 | 46            |
| 25.....          | 95                | 173           | 213            | 139                 | 108             | 18               | 176               | -----            | 229              | 85                | 142              | 59            | 124            | 114                | 98               | 200            | 122                 | 242           |
| 26.....          | 36                | 66            | 58             | 64                  | 48              | 34               | 125               | 88               | 301              | 288               | 150              | 42            | -----          | 14                 | 28               | 67             | 151                 | 252           |
| 27.....          | 236               | 93            | 120            | 26                  | 161             | 38               | 187               | 87               | 222              | 209               | 25               | 25            | 40             | 49                 | 61               | 98             | 33                  | 86            |
| 28.....          | 64                | 102           | 241            | 72                  | 197             | 22               | 180               | 188              | 122              | 130               | 206              | 90            | 229            | 130                | 68               | 66             | 228                 | 42            |
| 29.....          | 236               | 157           | 188            | 148                 | 220             | 28               | 110               | 68               | 178              | 113               | 235              | 202           | 222            | 247                | 118              | 225            | 212                 | 100           |
| 30.....          | 239               | 114           | 195            | 67                  | 110             | 53               | 134               | 251              | 202              | 131               | 211              | 166           | 218            | 141                | 141              | 174            | 207                 | 100           |
| 31.....          | 214               | 181           | 218            | 55                  | 108             | 28               | 158               | -----            | 262              | 254               | 191              | 113           | 155            | 111                | 143              | 246            | 118                 | 118           |
| Mean.....        | 172               | 118           | 169            | 88                  | 164             | 36               | 142               | 119              | 229              | 183               | 174              | 108           | 174            | 123                | 101              | 142            | 164                 | 123           |
| Departure.....   | +25               | +2            | +9             | -----               | +40             | -71              | +12               | -47              | -5               | -18               | +49              | +14           | +36            | +28                | +17              | +1             | +7                  | -12           |

## ACCUMULATED DEPARTURES ON DECEMBER 31, 1943

| +4218                              | +4286 | +6750 | ----- | -3831 | +6138 | +1895 | ----- | -6081 | +1053 | -4634 | ----- | -1357 | -3843 | ----- | ----- | ----- | ----- | ----- |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| PERCENTAGE DEPARTURES FOR THE YEAR |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| +3.4                               | +3.6  | +5.0  | ----- | -3.3  | +5.1  | +1.3  | ----- | -3.9  | +0.7  | -3.7  | ----- | -1.1  | -3.3  | ----- | ----- | ----- | ----- | ----- |

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR  
DECEMBER 1943

[Communicated by Capt. J. F. Hellweg, U. S. N. (Ret.), Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, area of spot or group, and spot count, are included assumed longitude of center of the disk, assumed latitude of center of the disk, total area of spots and groups, and total spot count.

| Date           | East-<br>ern<br>stand-<br>ard<br>time | Mount<br>Wilson<br>group<br>No. | Heliographic                                 |                     |                    |   | Area<br>of<br>spot<br>or<br>group | Spot<br>count | Plate<br>qual-<br>ity | Observatory  |
|----------------|---------------------------------------|---------------------------------|--|---------------------|--------------------|---|-----------------------------------|---------------|-----------------------|--------------|
|                |                                       |                                 | Dif-<br>fer-<br>ence<br>in<br>longi-<br>tude | Lon-<br>gi-<br>tude | Lat-<br>i-<br>tude | Dis-<br>tance<br>from<br>center<br>of<br>disk |                                   |               |                       |              |
| 1943<br>Dec. 1 | h m                                   |                                 | °  | °                   | °                  | °   |                                   |               |                       |              |
| 1              | 11 20                                 | 7627                            | -28  | 348                 | +6                 | 29  | 48                                | 2             | F                     | U. S. Naval. |
|                |                                       | 7627                            | -23  | 353                 | +5                 | 23  | 73                                | 9             |                       |              |
|                |                                       | 7626                            | +63  | 79                  | +13                | 63  | 145                               | 1             |                       |              |
|                |                                       |                                 | (16)   | (+1)                |                    |   | 266                               | 12            |                       |              |
| 2              | 12 14                                 | 7627                            | -14  | 348                 | +5                 | 15  | 24                                | 4             | F                     | Do.          |
|                |                                       | 7627                            | -11  | 351                 | +7                 | 13  | 24                                | 2             |                       |              |
|                |                                       | 7627                            | -7   | 355                 | +5                 | 9   | 97                                | 10            |                       |              |
|                |                                       | 7626                            | +77  | 79                  | +13                | 77  | 145                               | 1             |                       |              |
|                |                                       |                                 | (2)  | (+1)                |                    |   | 290                               | 17            |                       |              |
| 3              | 10 31                                 | 7627                            | -1   | 349                 | +6                 | 7   | 73                                | 3             | F                     | Do.          |
|                |                                       | 7627                            | +6   | 356                 | +5                 | 8   | 97                                | 10            |                       |              |
|                |                                       |                                 | (350)  | (+1)                |                    |   | 170                               | 13            |                       |              |
| 4              | 11 31                                 | 7627                            | +13  | 349                 | +6                 | 14  | 73                                | 4             | F                     | Do.          |
|                |                                       | 7627                            | +20  | 356                 | +5                 | 20  | 109                               | 11            |                       |              |
|                |                                       |                                 | (336)  | (+1)                |                    |   | 182                               | 15            |                       |              |
| 6†             | 16 30                                 | 7629                            | -73  | 235                 | +9                 | 72  | 194                               | 1             |                       | Mt. Wilson.  |
|                |                                       | 7628                            | -17  | 290                 | +4                 | 18  | 6                                 | 1             |                       |              |
|                |                                       | 7627                            | +46  | 353                 | +6                 | 47  | 24                                | 3             |                       |              |
|                |                                       |                                 | (307)  | (0)                 |                    |   | 224                               | 6             |                       |              |
| 7              | 11 10                                 | 7629                            | -63  | 234                 | +9                 | 64  | 194                               | 1             | G                     | U. S. Naval. |
|                |                                       | 7628                            | -6   | 291                 | +4                 | 7   | 6                                 | 1             |                       |              |
|                |                                       | 7627                            | +58  | 355                 | +5                 | 58  | 24                                | 3             |                       |              |
|                |                                       |                                 | (297)  | (0)                 |                    |   | 224                               | 6             |                       |              |
| 8              | 14 16                                 | 7629                            | -48  | 234                 | +9                 | 49  | 218                               | 1             | F                     | Do.          |
|                |                                       | 7627                            | +73  | 355                 | +5                 | 73  | 12                                | 1             |                       |              |
|                |                                       |                                 | (282)  | (0)                 |                    |   | 230                               | 2             |                       |              |
| 9              | 10 39                                 | 7629                            | -38  | 232                 | +9                 | 39  | 24                                | 1             | F                     | Do.          |
|                |                                       | 7629                            | -36  | 234                 | +9                 | 37  | 218                               | 1             |                       |              |
|                |                                       | 7630                            | +13  | 283                 | -7                 | 15  | 24                                | 9             |                       |              |
|                |                                       |                                 | (270)  | (0)                 |                    |   | 266                               | 11            |                       |              |
| 11             | 10 42                                 | 7629                            | -10  | 234                 | +8                 | 13  | 170                               | 1             | G                     | Do.          |
|                |                                       |                                 | (244)  | (0)                 |                    |   | 170                               | 1             |                       |              |
| 13             | 10 48                                 | 7629                            | +17  | 235                 | +8                 | 19  | 170                               | 1             | P                     | Do.          |
|                |                                       |                                 | (218)  | (-1)                |                    |   | 170                               | 1             |                       |              |
| 14             | 12 2                                  | 7631                            | -73  | 131                 | -22                | 74  | 194                               | 5             | G                     | Do.          |
|                |                                       | 7631                            | -67  | 137                 | -21                | 68  | 291                               | 10            |                       |              |
|                |                                       | (*)                             | +9   | 213                 | -6                 | 11  | 12                                | 2             |                       |              |
|                |                                       | 7629                            | +31  | 235                 | +8                 | 33  | 145                               | 1             |                       |              |
|                |                                       |                                 | (204)  | (-1)                |                    |   | 642                               | 18            |                       |              |
| 15             | 11 0                                  | 7631                            | -60  | 131                 | -22                | 62  | 291                               | 6             | G                     | Do.          |
|                |                                       | 7631                            | -53  | 138                 | -21                | 56  | 291                               | 11            |                       |              |
|                |                                       | 7629                            | +46  | 237                 | +8                 | 47  | 133                               | 1             |                       |              |
|                |                                       |                                 | (191)  | (-1)                |                    |   | 715                               | 18            |                       |              |
| 16             | 11 21                                 | 7631                            | -47  | 131                 | -22                | 50  | 388                               | 5             | G                     | Do.          |
|                |                                       | 7631                            | -44  | 134                 | -22                | 48  | 12                                | 3             |                       |              |
|                |                                       | 7631                            | -40  | 138                 | -22                | 44  | 194                               | 4             |                       |              |
|                |                                       | 7629                            | +58  | 236                 | +8                 | 59  | 121                               | 1             |                       |              |
|                |                                       |                                 | (178)  | (-1)                |                    |   | 715                               | 13            |                       |              |

571818-44-2

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR  
DECEMBER 1943—Continued

| Date       | East-<br>ern<br>stand-<br>ard<br>time | Mount<br>Wilson<br>group<br>No. | Heliographic                                 |                     |                    |   | Area<br>of<br>spot<br>or<br>group | Spot<br>count | Plate<br>qual-<br>ity | Observatory  |
|------------|---------------------------------------|---------------------------------|--|---------------------|--------------------|---|-----------------------------------|---------------|-----------------------|--------------|
|            |                                       |                                 | Dif-<br>fer-<br>ence<br>in<br>longi-<br>tude | Lon-<br>gi-<br>tude | Lat-<br>i-<br>tude | Dis-<br>tance<br>from<br>center<br>of<br>disk |                                   |               |                       |              |
| 1943<br>17 | h m                                   |                                 | °  | °                   | °                  | °   |                                   |               |                       |              |
| 17         | 10 45                                 | 7631                            | -35  | 130                 | -22                | 39  | 388                               | 4             | G                     | U. S. Naval. |
|            |                                       | 7631                            | -32  | 133                 | -20                | 37  | 48                                | 1             |                       |              |
|            |                                       | 7631                            | -30  | 135                 | -22                | 36  | 12                                | 1             |                       |              |
|            |                                       | 7631                            | -27  | 138                 | -23                | 33  | 242                               | 5             |                       |              |
|            |                                       | 7629                            | +70  | 235                 | +7                 | 71  | 121                               | 1             |                       |              |
|            |                                       |                                 | (165)  | (-1)                |                    |   | 811                               | 12            |                       |              |
| 18         | 10 44                                 | (*)                             | -76  | 76                  | +16                | 77  | 109                               | 1             | P                     | Do.          |
|            |                                       | (*)                             | -69  | 83                  | +15                | 70  | 24                                | 1             |                       |              |
|            |                                       | 7631                            | -22  | 130                 | -22                | 29  | 388                               | 5             |                       |              |
|            |                                       | 7631                            | -16  | 136                 | -22                | 27  | 48                                | 4             |                       |              |
|            |                                       | 7631                            | -13  | 139                 | -22                | 24  | 207                               | 2             |                       |              |
|            |                                       |                                 | (152)  | (-1)                |                    |   | 836                               | 13            |                       |              |
| 19         | 11 4                                  | (*)                             | -61  | 77                  | +17                | 63  | 48                                | 1             | G                     | Do.          |
|            |                                       | 7631†                           | -9   | 129                 | -23                | 25  | 388                               | 14            |                       |              |
|            |                                       | 7631†                           | -5   | 133                 | -21                | 21  | 48                                | 5             |                       |              |
|            |                                       | 7631                            | +1   | 139                 | -23                | 24  | 255                               | 2             |                       |              |
|            |                                       |                                 | (138)  | (-1)                |                    |   | 739                               | 22            |                       |              |
| 20         | 10 53                                 | 7631                            | +5   | 130                 | -23                | 22  | 436                               | 7             | G                     | Do.          |
|            |                                       | 7631                            | +9   | 134                 | -21                | 21  | 73                                | 7             |                       |              |
|            |                                       | 7631                            | +15  | 140                 | -23                | 26  | 242                               | 8             |                       |              |
|            |                                       |                                 | (125)  | (-2)                |                    |   | 781                               | 19            |                       |              |
| 21         | 13 27                                 | 7631                            | +19  | 130                 | -23                | 28  | 291                               | 9             | G                     | U. S. Naval. |
|            |                                       | 7631                            | +23  | 134                 | -21                | 29  | 73                                | 11            |                       |              |
|            |                                       | 7631                            | +28  | 139                 | -22                | 33  | 218                               | 5             |                       |              |
|            |                                       |                                 | (111)  | (-2)                |                    |   | 682                               | 25            |                       |              |
| 22         | 14 24                                 | 7631                            | +33  | 130                 | -22                | 38  | 170                               | 13            | G                     | Do.          |
|            |                                       | 7631                            | +41  | 138                 | -22                | 44  | 194                               | 5             |                       |              |
|            |                                       |                                 | (97)   | (-2)                |                    |   | 364                               | 18            |                       |              |
| 23         | 10 36                                 | 7631                            | +45  | 131                 | -22                | 46  | 145                               | 10            | F                     | Do.          |
|            |                                       | 7631                            | +40  | 135                 | -22                | 51  | 24                                | 1             |                       |              |
|            |                                       | 7631                            | +53  | 139                 | -23                | 55  | 121                               | 3             |                       |              |
|            |                                       |                                 | (86)   | (-2)                |                    |   | 290                               | 14            |                       |              |
| 24         | 11 1                                  | 7631                            | +55  | 128                 | -22                | 57  | 48                                | 6             | G                     | Do.          |
|            |                                       | 7631                            | +57  | 130                 | -22                | 59  | 73                                | 5             |                       |              |
|            |                                       | 7631                            | +60  | 133                 | -22                | 62  | 96                                | 3             |                       |              |
|            |                                       | 7631                            | +65  | 138                 | -23                | 67  | 97                                | 4             |                       |              |
|            |                                       |                                 | (73)   | (-2)                |                    |   | 254                               | 18            |                       |              |
| 25         | 14 58                                 | 7631                            | +73  | 130                 | -22                | 74  | 97                                | 3             | F                     | Mt. Wilson.  |
|            |                                       | 7631                            | +80  | 137                 | -23                | 80  | 73                                | 1             |                       |              |
|            |                                       |                                 | (57)   | (-2)                |                    |   | 170                               | 4             |                       |              |
| 26         | 11 33                                 |                                 | No spots                                     |                     |                    |   |                                   |               | G                     | Do.          |
| 27         | 16 27                                 |                                 | No spots                                     |                     |                    |   |                                   |               | F                     | Do.          |
| 29         | 10 48                                 |                                 | No spots                                     |                     |                    |   |                                   |               | G                     | U. S. Naval. |
| 30         | 10 56                                 |                                 | No spots                                     |                     |                    |   |                                   |               | G                     | Do.          |
| 31         | 17 25                                 | 7632                            | -6   | 331                 | -6                 | 7   | 16                                | 3             | F                     | Mt. Wilson.  |
|            |                                       |                                 | (337)  | (-3)                |                    |   | 16                                | 3             |                       |              |

Mean daily area for 26 days = 340

(\*) Not numbered.

†Data for December 6 taken from Mount Wilson chart.

VG=very good; G=good; F=fair; P=poor.

### PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR OCTOBER AND NOVEMBER 1943

[Based on observations at Zurich (or Locarno as indicated by asterisk). Data furnished through the courtesy of Prof. W. Brunner, Swiss Federal Observatory, Zurich, Switzerland]

| October<br>1943 | Relative<br>numbers | October<br>1943 | Relative<br>numbers | October<br>1943 | Relative<br>numbers |
|-----------------|---------------------|-----------------|---------------------|-----------------|---------------------|
| 1               | 15                  | 11              | *7                  | 21              | 0                   |
| 2               | 15                  | 12              | *0                  | 22              | 0                   |
| 3               | a 17                | 13              |                     | 23              | 0                   |
| 4               | 19                  | 14              | 0                   | 24              | d 9                 |
| 5               | 14                  | 15              | 0                   | 25              | *9                  |
| 6               | 13                  | 16              | 0                   | 26              | 9                   |
| 7               | 11                  | 17              | 0                   | 27              | *9                  |
| 8               | 10                  | 18              | 7                   | 28              | *9                  |
| 9               | *8                  | 19              | 9                   | 29              | 14                  |
| 10              | 10                  | 20              | 0                   | 30              | a 11                |
|                 |                     |                 |                     | 31              | 10                  |

Mean, 30 days=7.8

### PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR OCTOBER AND NOVEMBER 1943—Con.

| November | Relative<br>numbers | November | Relative<br>numbers | November | Relative<br>numbers |
|----------|---------------------|----------|---------------------|----------|---------------------|
| 1        | 10                  | 11       | 0                   | 21       | *d 11               |
| 2        | 10                  | 12       | 0                   | 22       | *15                 |
| 3        | 10                  | 13       | *Ec 10              | 23       | *13                 |
| 4        | *9                  | 14       | 13                  | 24       | 15                  |
| 5        | 8                   | 15       | 22                  | 25       | 16                  |
| 6        | 0                   | 16       | 25                  | 26       | a 13                |
| 7        | 0                   | 17       | 25                  | 27       | 20                  |
| 8        | 0                   | 18       | 0                   | 28       | *19                 |
| 9        | 0                   | 19       | *0                  | 29       | 20                  |
| 10       | 0                   | 20       | *0                  | 30       | *21                 |

Mean, 30 days=10.2

\*=Observed at Locarno.

a=Passage of an average-size group through the central meridian.

b=Passage of a large group through the central meridian.

c=New formation of a group developing into a middle or large center of activity; E, on the eastern part of the sun's disk; W, on the western part; M, in the central-circle zone.

d=Entrance of a large or average-sized center of activity on the east limb.

Chart I. Departure (°F.) of the Mean Temperature from the Normal, and Wind Roses for Selected Stations, December 1943

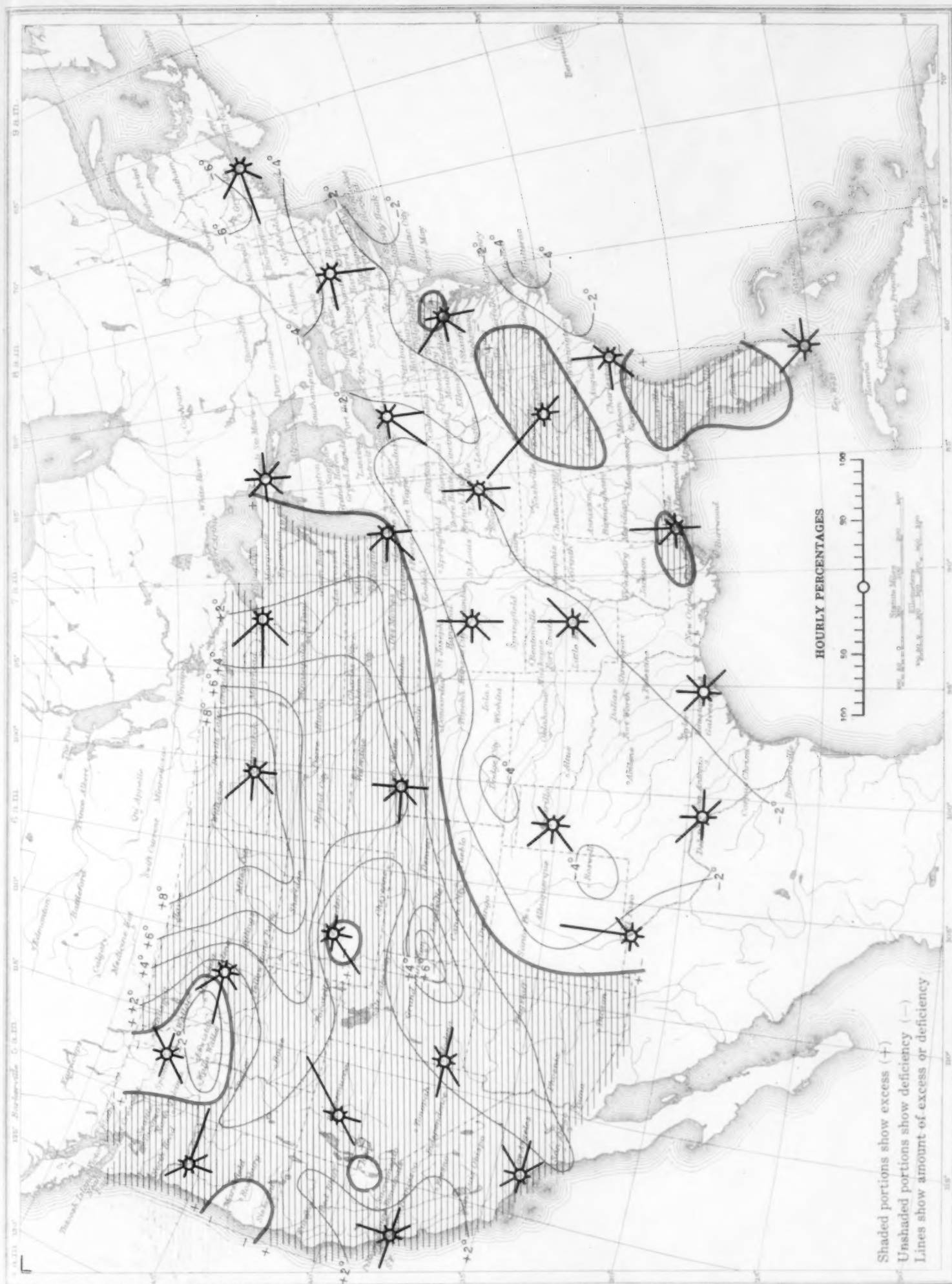
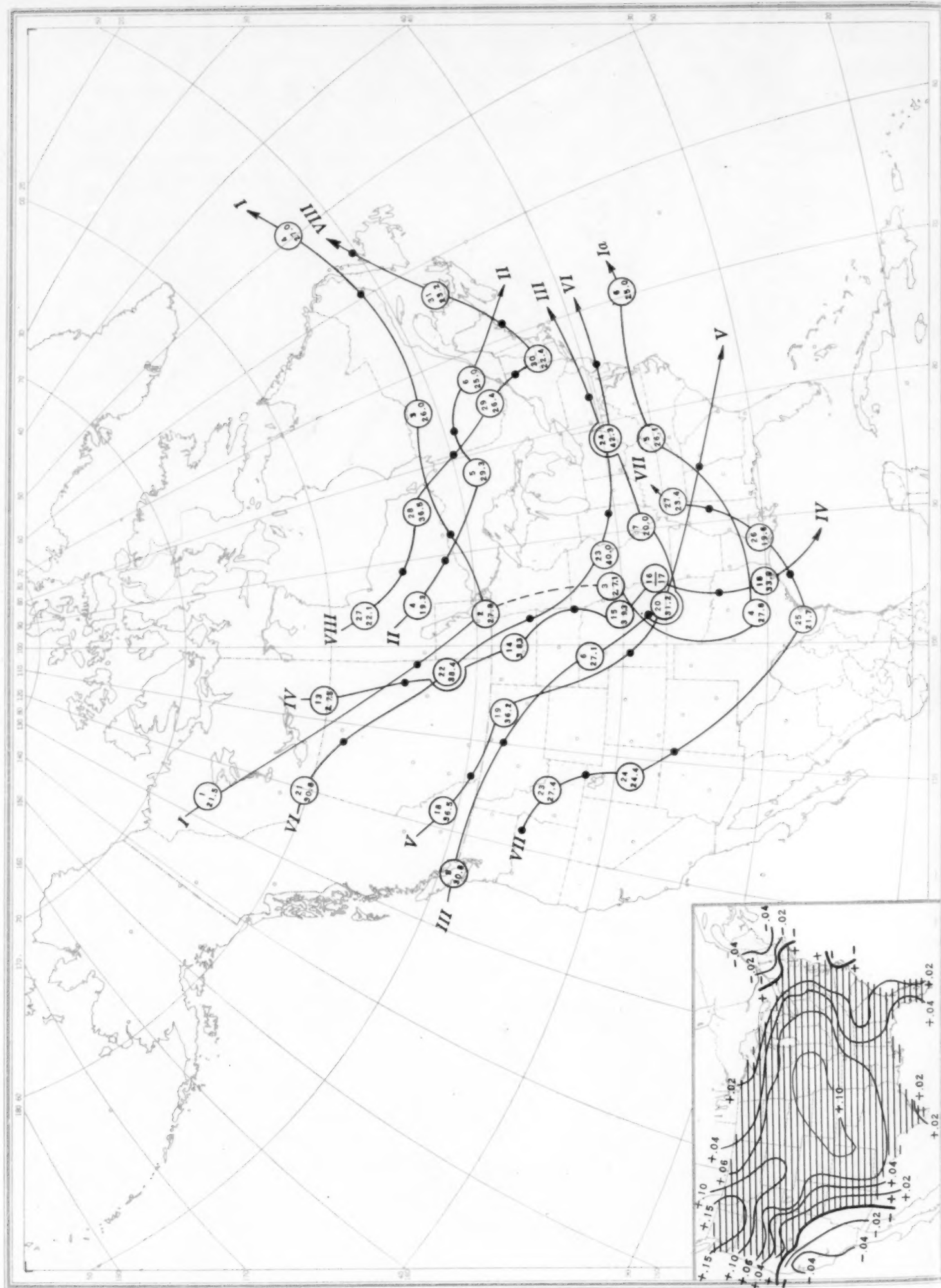


Chart II. Tracks of Centers of Anticyclones, December 1943. (Inset) Departure of Monthly Mean Pressure from Normal

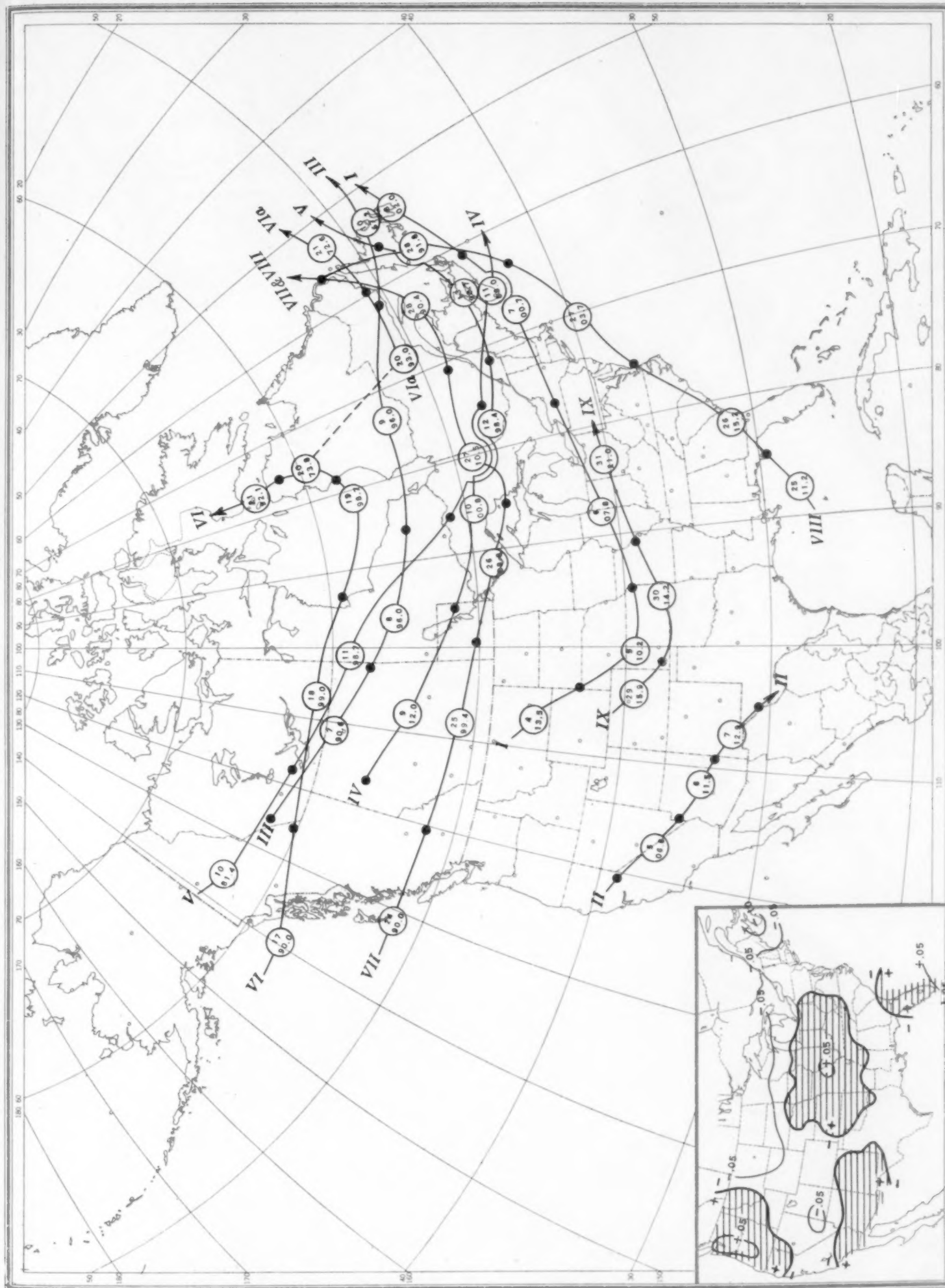


Circle indicates position of anticyclone at 7:30 a. m. (76th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (76th meridian time)

Chart III. Tracks of Centers of Cyclones, December 1943. (Inset) Change in Mean Pressure from Preceding Month

Circle indicates position of anticyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (75th meridian time)

Chart III. Tracks of Centers of Cyclones, December 1943. (Inset) Change in Mean Pressure from Preceding Month



Circle indicates position of cyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 7:30 p. m. (75th meridian time).

Chart IV. Percentage of Clear Sky Between Sunrise and Sunset, December 1943

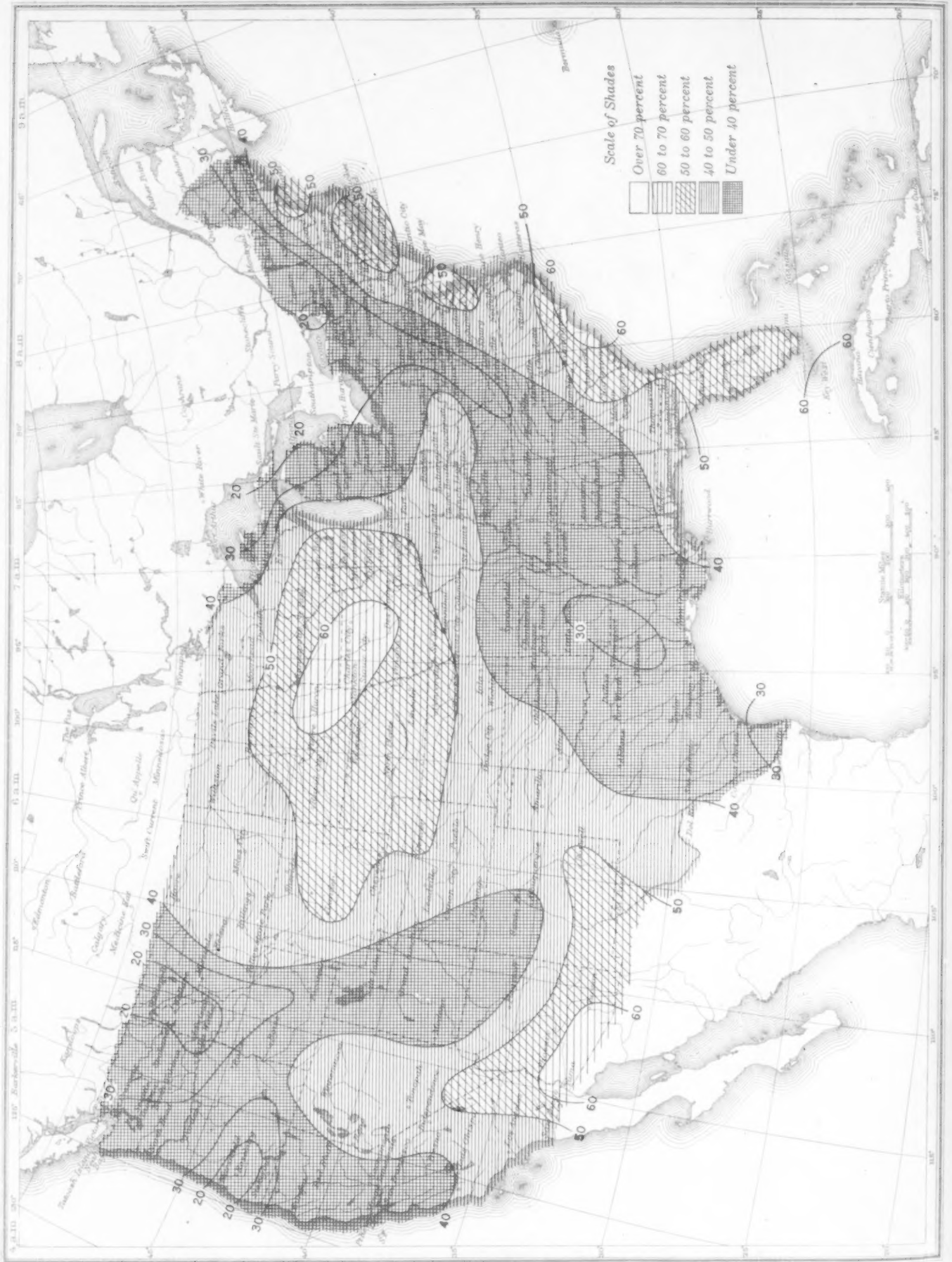


Chart V. Total Precipitation, Inches, December 1943. (Inset) Departure of Precipitation from Normal

Chart V. Total Precipitation, Inches, December 1943. (Inset) Departure of Precipitation from Normal

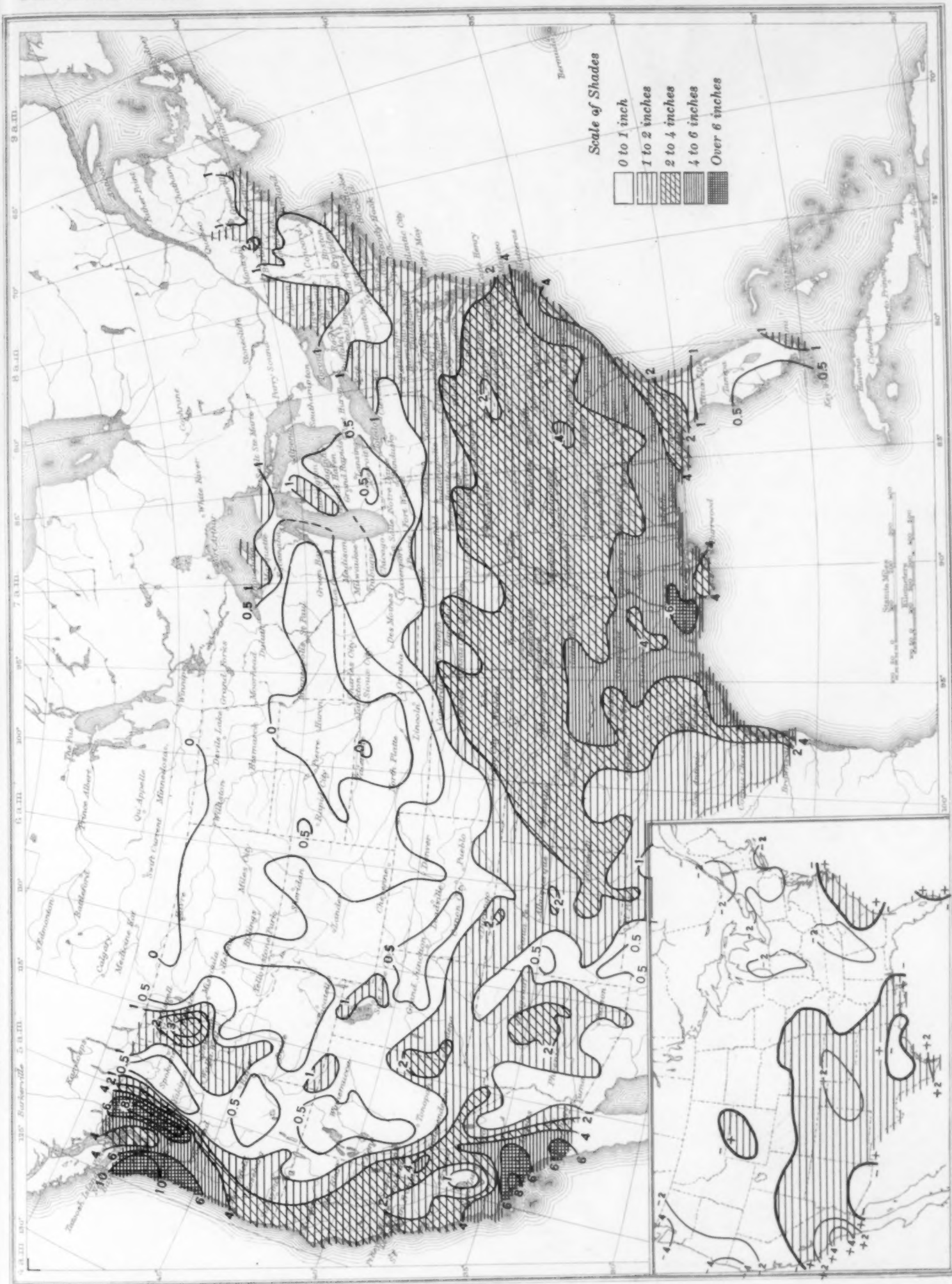


Chart VI. Isobars at Sea Level and Isotherms at Surface; Prevailing Winds, December 1943

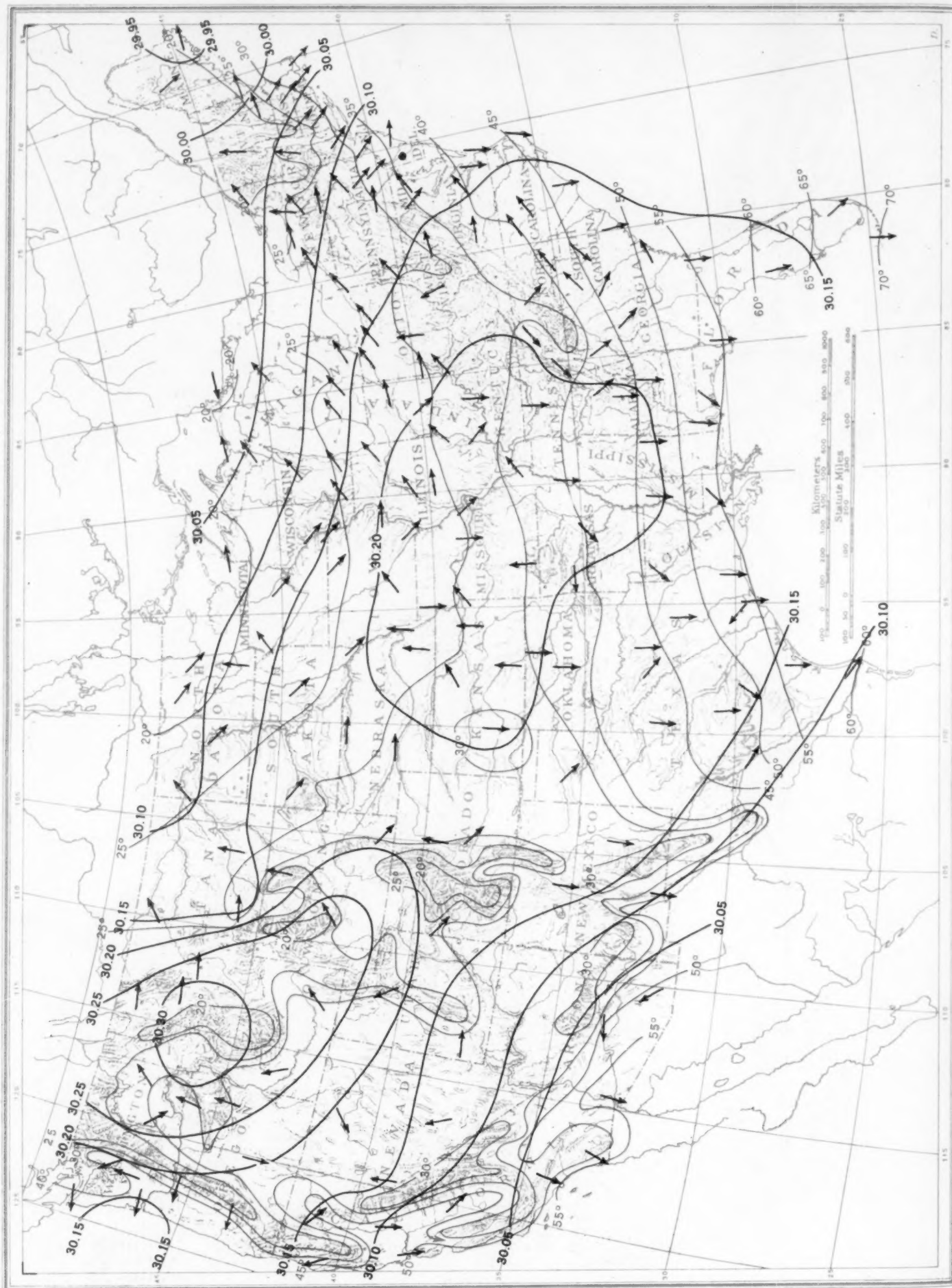


Chart VII. Total Snowfall, Inches, December 1943. (Inset) Depth of Snow on the Ground at 7:30 p. m., Monday, December 27, 1943

Chart VII. Total Snowfall, Inches, December 1943. (Inset) Depth of Snow on the Ground at 7:30 p. m., Monday, December 27, 1943



## MONTHLY WEATHER REVIEW

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